THE

TRANSACTIONS

OF

THE LINNEAN SOCIETY

OF

LONDON.

SECOND SERIES—VOLUME IV.

BOTANY.

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,, ,,	,, 52,	,,	galeopsis	,,	Galeopsis.
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,, 226,	,, 6,	,,	SETIFLORUS	,,	SETIFLORA.
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2nd Ser. BOTANY.] [VOL. IV. PART 1.

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TRANSACTIONS

OF

THE LINNEAN SOCIETY OF LONDON.

THE PLANTS OF MILANJI, NYASA-LAND, COLLECTED BY MR. ALEXANDER WHYTE, F.L.S.,

AND DESCRIBED BY

MESSRS. BRITTEN, E. G. BAKER, RENDLE, GEPP, AND OTHERS;

WITH AN INTRODUCTION

BY

WILLIAM CARRUTHERS, F.R.S., F.L.S.

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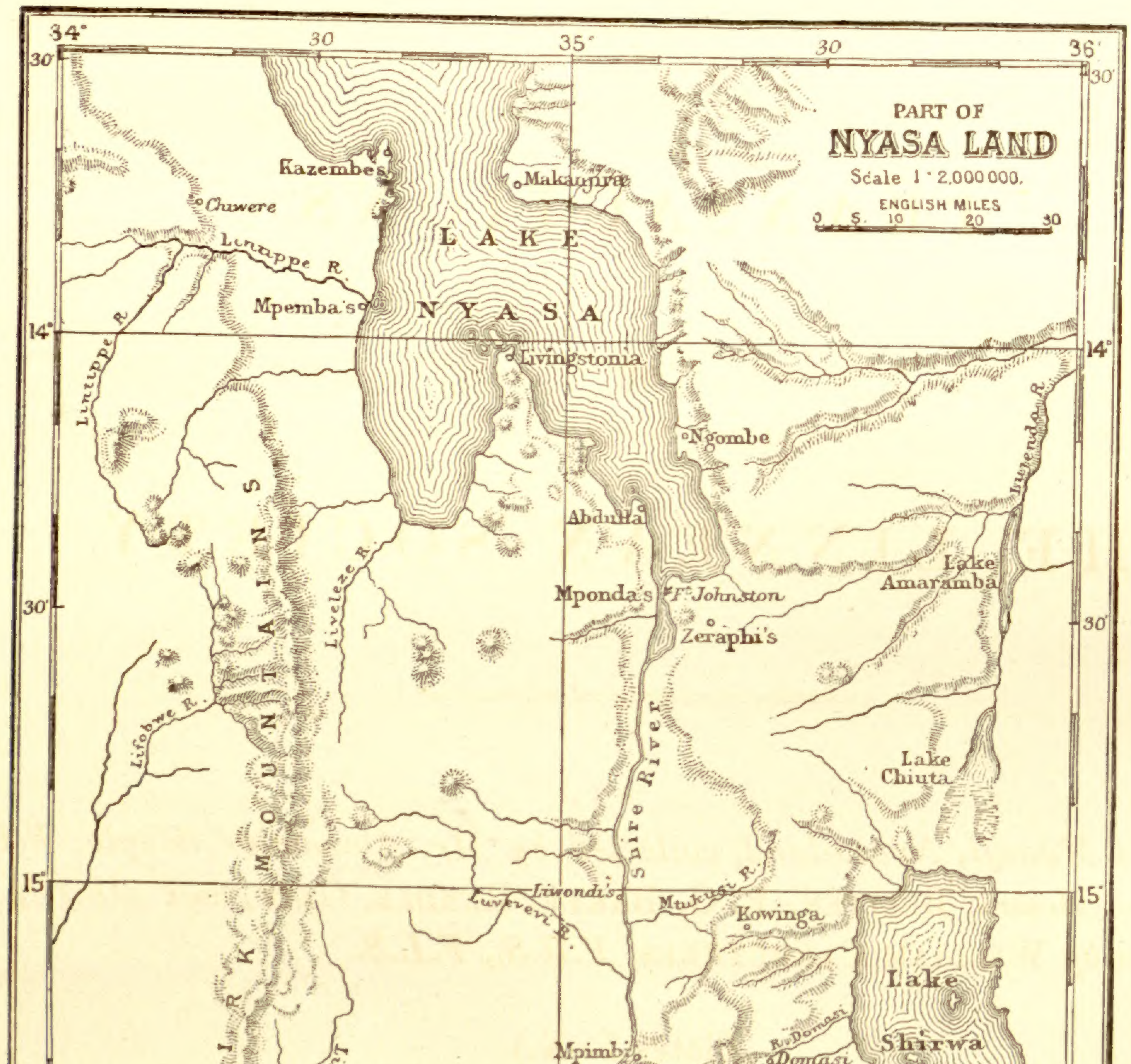
May 1894.



F. S. Weller.

MAP TO ILLUSTRATE MR. A. WHYTE'S BOTANICAL COLLECTIONS.

[*Originally prepared to illustrate* Mr. H. H. Johnston's *remarks on the Zoology* (Proc. Zool. Soc. 1893, p. 617), *and reissued by permission.*]

TRANSACTIONS

OF

THE LINNEAN SOCIETY.

I. *The Plants of Milanji, Nyasa-land, collected by Mr. Alexander Whyte, F.L.S., and described by Messrs.* BRITTEN, E. G. BAKER, RENDLE, GEPP, *and others; with an Introduction by* WILLIAM CARRUTHERS, *F.R.S., F.L.S.*

(Plates I.–X.)

Read 19th January, 1893.

INTRODUCTION.

AT the instigation of Mr. H. H. Johnston, C.B., Her Majesty's Commissioner and Consul-General in British Central Africa, Mr. Whyte, in October and November 1891, explored the Natural History of the mountain and district of Milanji, a region in Nyasa-land to the south of Lake Shirwa, in about 16° South latitude and $35\frac{1}{2}$° East longitude.

From Mr. Whyte's Report to Commissioner Johnston we learn that Milanji is an isolated range of, for the greater part, precipitous mountains, the main mass forming a huge natural fortress of weather-worn precipices, or very steep rocky ascents, sparsely clothed with vegetation. Many of its gullies and ravines are well wooded, and in some of them fine examples of grand African virgin forest are met with. The route by which Mr. Whyte ascended the mountain on the 20th October led up its south-east face, and at first zigzagged over steep grassy hills, down precipitous gorges, and across rocky streams with beds of large water-worn granite boulders, which, when flooded, become impassable mountain-torrents. Further on the ascent became more difficult, and he

clambered over precipices, holding on by tufts of grass and scrub, which gave but slender support and scanty foothold. Once round these precipitous bluffs an interesting wooded gorge was entered, still steep and difficult, but with better foothold on the projecting rocks and tree-roots; and most welcome was the kindly shade after hours of toil in a burning sun, rendered doubly fierce by the reflection from the scorching hot rocks.

An interesting change in the vegetation was perceptible, plants of the lower slopes being mostly replaced by species new to Mr. Whyte, and in many instances approaching the flora of temperate climes, such as brambles and well-known forms of papilionaceous and composite plants. Ferns, too, became more numerous, and now and again he scrambled through fairy dells of mosses, ferns, selaginellas, and balsams, with miniature water-falls showering their life-giving spray on the little verdant glades, while overhead hoary lichens and bright festoons of elegant long-tasselled lycopods hung from the moss-covered ancient-looking trees. Up and up he climbed the apparently endless ladder of roots and rocks. Then he passed through a dense thicket of bamboo, and again found himself confronted by an ugly barrier of precipitous cliffs, which were duly surmounted with the friendly aid of tufts of a tussock-grass springing from the crevices of the rocks. Another hour's climb up a steep grassy glen brought him to the crest of the highest ridge.

Here the scene spread out to view, and the climate, were such as fully to repay the explorer for a day of weary toil. Looking westward, he saw mapped out beneath him the plateau or basin of Milanji, with its rolling hills of grassy sward, its clearly defined belts of dark-green forest, and its numerous ravines and rivulets, all shaping their course towards the principal valley of the plateau, through which the Lutshenya flows. The climate was delightfully cool and bracing. During the forenoon, on the lower ridges of the mountains, at over 4000 feet lower than this point, he had sweltered in a stifling heat of 106 degrees Fahrenheit in the shade; while here he revelled in a clear, dry, health-restoring atmosphere of 60 degrees Fahrenheit. From this ridge, which forms one of the amphitheatre of hills surrounding the plateau or crater-like basin of Milanji, a good idea of the mountain-system is gained. Still looking towards the west, one sees on the right hand the main peaks of the mountain, rising directly from the valley of the Lutshenya, which runs parallel with its southern base, the height of one of the two summit-peaks having been calculated at 9,300 feet above sea-level. Across the table-land, in the distance, is the somewhat isolated and precipitous Tshambi Mountain, which, with its own smaller plateau, is separated from Milanji table-land by the rocky valley and gorge of the Likabula River. To the front and to the left hand, there is a continuation of the rolling and grassy hills which encircle the plateau, and which are capped with rugged cliffs of scarped granite and gneiss rocks.

Mr. Whyte spent two weeks on the plateau, changing to three different sites, each distant from 5 to 7 miles from the other, and which enabled him to explore more thoroughly this new and interesting mountain-country. Unfortunately the rains and mists set in before he left, and consequently he had only nine good collecting days.

The flora of the mountain proved to be most interesting, the species met with being mostly distinct from those of the plain or even the lower slopes. The most striking botanical feature of the plateau is a large cypress. The remnant left of this fine conifer is confined to a few of the upper ravines and valleys, the largest forest of them finding a comparatively secure habitat in the damp gorges of the Lutshenya valley. A few old scorched monarchs of the glen lead a precarious existence pretty well up the southern slopes of the main mountain; but, unless steps are taken to protect them, these interesting relics of the past are doomed to speedy destruction. It is deplorable to witness the devastating effects of the annual bush-fires, from which even this lofty and all but inaccessible retreat is not exempt. During the dry months of August and September these fires, originating from the villages on the lower slopes of the mountain, gradually creep up the precipitous cliffs from tuft to tuft of grass until at last they reach the grassy plateau. Once there, the work of destruction is rapid. The fire rages over the table-land and eats its way along the edges of the remaining belts of forest, annually scorching, if not burning, the bark and timber of the outside trees, and killing outright the young seedlings. In exceptionally dry seasons it appears that these fires have even penetrated some of the damp forests, and hundreds of giant cypresses lay prostrate and piled on each other in all stages of destruction, but generally burnt right through at the base of the tree. Mr. Whyte measured several of these dead conifers, and one (by no means the largest met with) was 140 feet in length and 5½ feet in diameter at 6 feet from its base, with a clear straight stem of 90 feet. The cones of this species of cypress (which may be new to science) are somewhat smaller than a chestnut, and open into four scales, each having a spur at its apex, and covering five or six winged seeds. The foliage is juniper-like, and the timber is of a dull reddish white colour, of excellent quality and easily worked. The bark on old trees is of great thickness.

Tree-ferns attain a great size in the damp shady forests of the plateau; one measured was 30 feet in height and 2 feet in diameter at its base.

Mr. Whyte was impressed with the gorgeous displays of wild flowers in some favoured nooks of these highlands. There he observed creamy-white and yellow helichrysums, mingling with purple and blue orchids and irises, and graceful snow-white anemones, all blooming in wild profusion, and rearing their heads from a bed of bright-green grassy sward—a floral carpet which Nature alone can fashion. Altogether he procured several thousand specimens of dried plants. The grass-lands had been too recently burned to permit many of the plants reaching their flowering stage.

Of the 64 Natural Orders to which the flowering plants belong, nearly half are represented by single species. *Compositæ* are most numerous, having 50 species, and are followed by *Leguminosæ* with 28 species.

The great majority of the known and described species obtained by Mr. Whyte from Milanji have already been noted from Tropical Africa. If to these are added the species here described for the first time, it appears that no less than 62 per cent. belong to tropical vegetation. Of the remainder a small number, amounting to 6 per cent., are plants widely distributed over the tropical and subtropical regions of the world, such as

species of *Stellaria*, *Abutilon*, *Cassia*, *Ageratum*, *Bidens*, and *Celosia*. Thirteen per cent. of the species are North-African plants, the majority being found in Abyssinia, while 19 per cent. are South African. Excluding the widely distributed tropical plants, only two species, one of *Clausena* and the other of *Asystasia*, occur in both North and South Africa. Milanji is obviously in the region where the floras of North and South Africa meet, and intermingle in nearly equal proportions with the tropical vegetation more proper to the region.

Among the plants of interest which have a southern facies are two species of *Erica*, carrying this South-African genus into the Tropics, and the fine *Widdringtonia*, which attains a great size, and is fitted to supply in the future a useful timber. Several Malagasy plants are in the collection, and among these there are species of *Epallage*, *Mascarenhasia*, and *Brachystephanus*, genera that have hitherto been considered endemic to Madagascar *.

It deserves to be noted that a large proportion of the Polypetalous plants belong to genera, and often to species, widely distributed over the face of the globe, while a large number of the Monopetalæ are not known out of Africa. The actual state of the case is that 17 per cent. of the genera of the Polypetalæ, 35 per cent. of the Monopetalæ, 25 per cent. of the Apetalæ, and 28 per cent. of the Monocotyledones are confined to Africa. In view of the greater antiquity of the less differentiated plants, it is remarkable that the Polypetalæ, as tested by the genera included in this memoir, have secured the widest world-distribution.

POLYPETALÆ. (By Edmund G. Baker, F.L.S.)

Anemone Whyteana, Baker fil., n. sp. (Plate I. figs. 1–3.) Radix perennis; caule nullo; foliis longe petiolatis, biternatim sectis vel partitis, segmentis subcoriaceis ultimis cuneato-obovatis, serratis, apice apiculatis, marginibus plus minusve irregulariter acute lobatis; petiolis canaliculatis, præcipue ad basin villosis; scapis erectis, ramosis, 3–8-floris; involucri bracteis lanceolatis vel ovatis acutis, villosis, interdum trisectis, segmentis anguste ovatis vel lanceolatis; involucelli bracteis lanceolatis acutis; pedicellis albo-pubescentibus; sepalis albis, imbricatis, oblongis vel ovatis, externe pilosis; stylis brevibus; stigmatibus bifurcatis; receptaculo ovoideo piloso; carpellis oblongis, numerosis, glabris vel glabriusculis, sine cauda plumosa.

Hab. Milanji, alt. 6000 ft. No. 100.

Scape 1–2 ft. high; leaflets 1–1½ in. long, ⅓–½ in. broad; sepals ½–¾ in. long; carpels ⅐ in. long.

This is the second member of the genus which has been found in Tropical Africa, and I have called it after the discoverer, Mr. A. Whyte. It has somewhat the habit of a *Knowltonia*, but has not the green sepals which are characteristic of that genus. It differs from *A. Thomsoni*, Oliver, in Icones Plantarum, t. 1491, in the leaves being

* Since this was written four species of *Brachystephanus* have been described from Tropical Africa.

biternate and not triternate, and it appears perfectly distinct from the three Cape and Natal species of Anemone, *A. capensis*, Linn., Bot. Mag. t. 716, *A. caffra*, Eckl. & Zeyh., Harv. Thes. t. 7, and *A. Fanniniæ*, Harv., Bot. Mag. t. 6958.

Thalictrum rhynchocarpum, Dill. et A. Rich. in Ann. Sc. Nat. sér. II. xiv. p. 262; Oliver, Flora of Tropical Africa, i. p. 8.
Hab. Milanji, alt. 6000 ft. No. 159.
Distr. Mountains of Abyssinia; Camaroons; Clarence Peak, Fernando Po.

Cissampelos Pareira, Linn.; Oliver, Fl. Trop. Afr. i. p. 45.
Hab. Zomba.
Widely spread in the Tropics.

Cleome monophylla, Linn.; Oliver, *l. c.* i. p. 76; Trans. Linn. Soc. ser. I. xxix. t. 5.
Hab. Zomba; Milanji. No. 133.
Widely spread in Tropical Africa. Occurs also at the Cape.

Viola abyssinica, Steud. in Schimp. Pl. Abyss. ii. n. 983; Oliver, *l. c.* i. p. 105.
Hab. Milanji, alt. 6000 ft. No. 79.
Distr. Mts. of Abyssinia; Camaroons; Fernando Po; Kilimanjaro; Madagascar.

Aphloia theæformis, Benn. Pl. Jav. Rar. p. 192, in adnot., *affinis.*
Hab. Milanji, alt. 6000 ft.
Has rather larger flowers than the usual form of this plant. Malagasy affinity.

Polygala virgata, Thunb.; Harv. in Harv. & Sond. Fl. Capensis, i. p. 85.
Hab. Milanji, alt. 6000 ft. No. 104.
Distr. Cape, Natal.

Polygala persicariæfolia, DC. Prod. i. p. 326; Oliver, *l. c.* i. p. 129.
Hab. Zomba; Milanji, alt. 6000 ft. No. 185.
A very variable plant, widely spread in the Tropics of the Old World.

Muraltia mixta, L.; Harv. in Harv. & Sond. Fl. Capensis, i. p. 104.
Hab. Milanji, alt. 6000–7000 ft. No. 1.
Distr. Cape.

Silene Burchellii, Otth, in DC. Prodr. i. p. 374; Oliver, *l. c.* i. p. 139.
Hab. Milanji, alt. 6000 ft. No. 135.
Distr. Abyssinia; Cape; also in Arabia and Syria acording to Oliver's 'Flora of Tropical Africa,' but Rohrbach in his monograph restricts it to South Africa.

CERASTIUM AFRICANUM, Oliver, *l. c.* i. p. 141.
Hab. Milanji. No. 115.
Found also on Mt. Kilimanjaro and the Camaroons.

STELLARIA MEDIA, Cyr.; Smith, Eng. Bot. t. 537.
Hab. Milanji, 6000 ft. No. 147.
Differs from the plant as found in this country by its much thicker leaves and more congested inflorescence.

HYPERICUM LANCEOLATUM, Lam.; Oliver, Fl. Trop. Afr. i. p. 156.
Hab. Milanji, 6000 ft.
Distr. Abyssinia; Camaroons; Fernando Po; Kilimanjaro; Masai Highlands; Manganya Hills. Previously collected in Shiré Highlands by Last and Buchanan. Occurs also in Madagascar.

HYPERICUM PEPLIDIFOLIUM, A. Rich., var. ROBUSTUM, Baker fil. Caulibus adscendentibus; foliis glabris oblongis vel ovatis, quam ea typi majoribus; floribus axillaribus solitariis post anthesin deflexis.
Hab. Zomba; Milanji. No. 143.

ABUTILON INDICUM, Sweet, Hort. Brit. ed. i. p. 54; Oliver, *l. c.* i. p. 186.
Hab. Milanji, alt. 6000 ft. Nos. 63, 154.
Widely spread in the Tropics.

HIBISCUS CANNABINUS, Linn.; DC. Prod. i. p. 450; Oliver, *l. c.* i. p. 204.
Hab. Zomba.
Widely spread in the Tropics.

HIBISCUS PHYSALOIDES, Guill. & Perr. Fl. Seneg. p. 52; Harv. in Harv. & Sond. Fl. Capensis, i. p. 172.
Hab. Zomba; Milanji. No. 196.
Distr. Trop. Africa; Cape. J. M. Wood, no. 926, is this species.

TRIUMFETTA MASTERSII, Baker fil., n. sp. (*Triumfetta Welwitschii*, Mast. in Oliver, Flora of Trop. Africa, i. p. 255, in parte.) Caule ligneo, ramis virgatis, canaliculatis, præcipue superne cinereo-pubescentibus; stipulis subulatis vel anguste lanceolatis, deciduis; foliis similibus *Ceanothi* foliis, breviter petiolatis, oblongis vel oblanceolatis, serratis, basi cuneatis, apice rotundatis vel subacutis, e caule florifero cum floribus coætaneis productis, discoloribus, palmatim 3–5-nervatis, supra nigrescentibus, subtus cinereo-pubescentibus; floribus terminalibus ramoso-corymboso-cymosis; alabastris externe fulvo-pubescentibus; petalis in sicco flavis, oblanceolatis vel anguste obovatis,

ad basin pubescentibus; staminibus circiter 25 e toro elevato crassoque dispositis; fructu cerasi parvi magnitudine, setis rectis ciliatis elongatis obtecto.

Hab. Milanji, alt. 6000 ft. Nos. 163 and 105.

Branches 1–2 ft. long; leaves 3–3¼ in. long, ¾ in. broad.

This plant is the same as a specimen collected by Sir J. Kirk on the Livingstone Expedition near Lake Nyasa. It appears distinct from the Angola plant, and I venture to separate the East-Tropical African species under the name *Triumfetta Mastersii*, and, to avoid confusion, append a short description of *T. Welwitschii* *.

T. Mastersii has also been collected in Nyasa-land by J. Buchanan, No. 1341; it is closely allied to *T. Rehmanni*, Szyszyl. in 'Rozprawy i sprawozdania z posiedzen,' p. 151 (1887), from the Transvaal, and is also allied to the curious and distinct *T. geoides*, Welw.

Geranium simense, Hochst. in Schimp. Pl. Abyss. ii. p. 670; Oliver, *l. c.* i. p. 291.

Hab. Milanji, alt. 6000 ft. No. 72.

Distr. Abyssinia; Kilimanjaro; Camaroons. Occurs also in Madagascar.

Impatiens micrantha, Hochst.? in Schimp. Pl. Abyss. ii. n. 1151, *affinis.*

Hab. Milanji, alt. 6000 ft. Nos. 15, 140.

Distr. Abyssinia. Closely allied to *I. capensis*, Thunb.

Impatiens shirensis, Baker fil., n. sp. (Plate I. figs. 4–13.) Caule erecto, ligneo, ramoso; foliis membranaceis, anguste ovatis acutis vel acuminatis, penninervatis, petiolatis, serratis, basi cuneatis; floribus axillaribus solitariis; pedunculis quam petiola longioribus vel subæqualibus, medio ebracteatis; sepalis lateralibus parvis, anguste ovatis acutis vel subacuminatis; labello naviculari abrupte calcarato, calcare brevi curvato (petalis sepalisquein sicco flavis); vexillo ad apicem mucronato, tam lato quam longo, alis bilobatis auriculatis; ovario late lineari curvato; stigmate capitato.

Hab. Milanji, alt. 6000 ft. No. 55.

Stem 1 ft. long, possibly more; leaves 2½–4 in. long, ¾–1⅓ in. broad; spur ¼ in. long.

The affinity of this plant is with *Impatiens bicolor*, Hook. f., *I. buccinalis*, Hook. f., *I. Mackeyana*, Hook. f., and the recently described *I. Ehlersii*, Schweinf., as the flowers are solitary and axillary, and the lip is boat-shaped and possesses a short incurved spur.

* Triumfetta Welwitschii, Mast. in Oliver, Fl. Trop. Afr. i. p. 255, in parte. Caule ligneo, ramis virgatis tenuiter canaliculatis, plus minusve teretibus, superne cinereo-pubescentibus; stipulis subulatis subpersistentibus, petiolis longioribus, foliis breviter petiolatis, longioribus et angustioribus quam *T. Mastersii* folia, basi cuneatis, apice acutis, tenuiter serratis, e caule florifero post anthesin productis, parce discoloribus, penninervatis, interdum subpalmatinervatis; floribus terminalibus ramoso-corymboso-cymosis, alabastris externe fulvo-tomentosis, petalis luteis, obovatis vel oblanceolatis; fructu mihi ignoto, ex descriptione Welwitschii fructui *T. Mastersii* simili.

Hab. Angola; Pungo Andongo, *Welwitsch.*

Branches 1–2 ft. long; leaves 4–5 in. long, ½ in. broad.

T. Welwitschii differs from *T. Mastersii* in having longer and narrower leaves, which are produced on the same stem as, but subsequently to, the flowers.

OXALIS SENSITIVA, Linn.; Oliver, *l. c.* i. p. 297.
Hab. Zomba.
Widely distributed in the Tropics.

CLAUSENA INÆQUALIS, Benth. in Hook. Niger Fl. p. 257; Oliver, Fl. Trop. Afr. i. p. 307.
Hab. Milanji. No. 49.
Distr. Abyssinia; Camaroons; Cape.

GYMNOSPORIA LAURINA, Szyszyl. in 'Rozprawy i sprawozdania z posiedzen,' xviii. p. 35, *forma.*

Scytophyllum laurinum, Eckl. & Zeyh.; Sond. in Harv. & Sond. Fl. Capensis, i. p. 471.
Celastrus laurinus, Thunb. Fl. Capensis, p. 217.

Hab. Milanji, alt. 6000 ft. No. 51.
The specimens from Milanji differ slightly in the shape of the leaves from the type found at the Cape of Good Hope.
There is another species of *Gymnosporia* in the collection, No. 50, but the material is not sufficient to settle the species.

PHYLICA SPICATA, Linn.?; Harv. in Harv. & Sond. Fl. Capensis, i. p. 491.
Hab. Milanji, alt. 6000 ft. No. 41.
Distr. Cape.

VITIS SERPENS, Baker, in Oliver, Fl. Trop. Afr. i. p. 412.
Cissus serpens, Hochst. in A. Rich. Fl. Abyss. i. p. 111.
Hab. Zomba.
Distr. Abyssinia; Senegambia.
There is another species of *Vitis*, but the material is insufficient for determination.

PAULLINIA PINNATA, Linn.; Baker, in Oliver, Fl. Trop. Afr. i. p. 419.
Hab. Zomba.
Also found in Tropical America.

CROTALARIA NATALITIA, Meissn. in Hook. Lond. Journ. Bot. ii. p. 67; Baker, *l. c.* ii. p. 34.
Hab. Zomba.
Distr. Natal; Lower Guinea.

CROTALARIA RECTA, Steud.; Baker, *l. c.* ii. p. 40.
Hab. Milanji.
Distr. Abyssinia; Zambesi-land.

ADENOCARPUS MANNII, Hook. fil. in Journ. Linn. Soc. vi. p. 8.

Hab. Milanji, alt. 6000 ft. Nos. 57, 127.

Collected also by J. Buchanan in Nyasa-land, No. 988.

Distr. Kilimanjaro; Camaroons; Fernando Po.

LOTUS ARABICUS, Linn.; Baker, in Oliver, Fl. Trop. Afr. ii. p. 62.

Hab. Milanji, alt. 6000 ft. Nos. 80, 142.

Distr. Abyssinia; Senegambia; Zambesi-land. Occurs also in the Eastern Mediterranean Region and Arabia.

INDIGOFERA LYALLII, Baker, in Journ. Linn. Soc. xx. p. 128.

Hab. Milanji. No. 11.

A Mascarene species, new to the Flora of Tropical Africa. Differs slightly from type in the pubescence on the underside of the leaflets.

TEPHROSIA LINEARIS, Pers.; Baker, *l. c.* ii. p. 120.

Hab. Milanji.

Distr. Nubia; Upper and Lower Guinea.

TEPHROSIA SERICEA, Baker, *l. c.* ii. p. 107.

Hab. Zomba.

Also collected on the Manganya Hills.

TEPHROSIA WHYTEANA, Baker fil., n. sp. Fruticosa; ramis superne petiolisque ferrugineo-pilosis; foliis imparipinnatis, foliolis oblongis, apice mucronatis, basi rotundatis, lateralibus 6–8-jugis, margine et subtus media vena ferrugineo-pubescente, stipulis lanceolatis vel ovatis acuminatis; floribus racemosis, calycis tubo campanulato pubescente, lobis deltoideis, cuspidatis, duobus conniventibus; petalis (in sicco roseis vel purpureo-roseis) vexillo rotundato unguiculato, alis inæquilateraliter obovatis, carinam subæquantibus; staminibus monadelphis, filamento vexillari sublibero, stylo applanato, incurvato, pubescente; ovario lineari-oblongo; legumine recto lineari-oblongo, sessili, dense rufo-piloso, apice apiculato 6–8-spermo.

Hab. Milanji.

Leaflets 1–1½ in. long, nearly ½ in. broad, legume 1½–2 in. long.

Near *Tephrosia barbigera*, Welw., which, however, is a robust annual.

TEPHROSIA NYASÆ, Baker fil., n. sp. Caule ligneo ramoso, ramis junioribus albo-pubescentibus; foliis pinnatim multifoliolatis, foliolis 6–10-jugis oblongis, apice apiculatis, basi rotundatis vel cuneatis, coriaceis, penninervatis, superne viridibus, parce pubescentibus, subtus argenteo-canescentibus, vena media sæpe ferrugineo-pubescente; floribus ad apicem ramulorum aggregatis, bracteis ovatis acutis, pedicellis brevibus; calycis tubo externe ferrugineo vel albo-ferrugineo, laciniis lanceolato-linearibus vel lanceolatis; petalis (in sicco roseis vel purpureis) vexillis

suborbicularibus externe pubescentibus, carinæ alis subæquilongis, stamine superiore ad medium libero; leguminibus junioribus dense ferrugineo-pilosis, circ. 5-spermis.

Hab. Nyasa-land (*J. Buchanan*, No. 51).

Leaflets 1–1⅝ in. long, ⅓ to rather more than ½ in. broad; standard about ½ in. long.

The flowers of this plant are borne in dense terminal heads at the end of the branchlets.

ÆSCHYNOMENE SIIFOLIA, Welw.; Baker, in Oliver, Fl. Trop. Afr. ii. p. 151.

Hab. Zomba; Milanji.

In the 'Flora of Tropical Africa' the articulations of the fruit are described as solitary, which I find to be generally, but not always, the case.

Previously collected by Welwitsch in Lower Guinea, Pungo Andongo, alt. 3800 ft.

ÆSCHYNOMENE, sp.

Hab. Milanji, 6000 ft.

DESMODIUM HIRTUM, Guill. & Perr. Fl. Seneg. Tent. ii. p. 209; Baker, *l. c.* ii. p. 163.

Hab. Zomba.

Distr. Upper and Lower Guinea; Zambesi-land; Natal.

DESMODIUM ASCENDENS, DC. Prod. ii. p. 332; Baker, *l. c.* ii. p. 162.

Hab. Zomba.

A rather depauperated form of this common American species. It also occurs in Upper and Lower Guinea.

MUCUNA CORIACEA, Baker, *l. c.* ii. p. 187.

Hab. Milanji.

Distr. Zambesi-land, Manganya Hills.

CANAVALIA OBTUSIFOLIA, DC. Prod. ii. p. 404; Baker, *l. c.* p. 190.

Hab. Milanji.

Widely distributed through the Tropics of both Hemispheres.

VIGNA VEXILLATA, Benth. in Mart. Fl. Bras. xv. pt. 1, p. 193, t. 50. f. 1.

Hab. Zomba; Milanji.

Widely dispersed through Tropical America.

VIGNA LUTEOLA, Benth. *l. c.* p. 194, t. 50. f. 2.

Hab. Zomba; Milanji, alt. 6000 ft.

Like the last, also found in Tropical America.

DOLICHOS ERECTUS, Baker fil., n. sp. Perennis, caule erecto, glabro vel glabriusculo, angulato vel subterete; foliis trifoliatis petiolatis, petiolis strictis patentibus vel erecto-patentibus, canaliculatis, foliolis ultimis æquilateralibus, ovatis vel ovato-lanceolatis acutis, apice breviter mucronatis, utrinque glabris vel glabriusculis, junioribus pubescentibus, basi rotundatis vel subcordatis, penninervatis, foliolis

lateralibus inæquilateralibus, stipulis lanceolatis acutis persistentibus; pedunculis axillaribus, præcipue ultimis, longissimis, 3–8-floris; floribus ad apices pedunculorum aggregatis, racemosis; bracteis ovatis membranaceis; sepalis brevibus ovatis; petalis (in sicco flavis) calyce multo longioribus; stylis geniculatis teretibus, stigmatibus clavatiformibus, ovariis linearibus.

Hab. Zomba, Milanji, alt. 6000 ft.

Stem 1–1½ ft., possibly more; lower peduncles 5–7 in. long; leaflets about 2 in. long, petals nearly ½ in. long.

This plant is allied to one collected by Dr. Schweinfurth in Djurland, no. 1366. The latter has, however, much narrower leaflets.

Dolichos erectus does not belong to the section *Streptostylis* of Welwitsch, the style being not twisted; the erect habit and the few flowered racemes therefore make it easy of recognition. *D. simplicifolius*, recently figured in the 'Botanical Magazine' (t. 7318), also from the Shiré Highlands, has unifoliolate leaves.

Cajanus indicus, Spreng. Syst. Veg. iii. p. 248; Baker, in Oliver, Fl. Trop. Afr. ii. p. 216.

Hab. Milanji. No. 155.

Cultivated throughout the Tropics.

Eriosema cajanoides, Hook. fil., in Fl. Nigrit. p. 314; Baker, *l. c.* ii. p. 227.

Hab. Milanji.

Common in Tropical Africa; extends southwards to Natal.

Eriosema parviflorum, E. Mey.; Baker, *l. c.* ii. p. 225.

Hab. Milanji, alt. 6000 ft. No. 38.

This may be an allied species, as the flowers are larger and not so depressed as usual.

Eriosema shirensis, Baker fil., n. sp. (Plate II. figs. 1–4.) Caule erecto, basi ligneo, præcipue superne patentim albo- vel rufo-piloso; foliolis 3 oblongo-lanceolatis, membranaceis, acutis, utrinque albo-pilosis, subtus vena media rufo-pilosa, foliolis lateralibus inæquilateralibus, petiolis brevibus, stipulis lanceolatis; pedunculis foliola subæquantibus, ad apicem floribus reflexis dense vel subdense racemosis; sepalis lanceolatis acuminatis, albo-pilosis; vexillo biauriculato, alis carina paullo longioribus vel subæquantibus; stylo geniculato, ultra medium parce incrassato, apice capitato-stigmatoso; legumine patente rufo-piloso, 2-spermo, oblique apiculato; seminibus nigrescentibus, oblongis, curvatis.

Hab. Zomba.

Stem 8 in. to 1 ft. high; leaflets 2½–4 in. long, ½–⅓ in. broad; flowers ¼ in. long; legume ½ in. long, ⅓ in. broad.

This plant is the same as Nos. 31 and 1350 collected by J. Buchanan in the Shiré Highlands. It comes near to *Eriosema Burkei*, Benth., and *E. salignum*, E. Mey., but differs from both in the pubescence. The flowering peduncle is clothed with rather long patent, white hairs.

Flemingia macrocalyx, Baker fil., n. sp. (Plate II. figs. 5–12.) Fruticosa, ramis flexuosis, dense fulvo-tomentosis; foliis trifoliatis, foliolis ovatis acutis, coriaceis vel subcoriaceis, basi rotundatis, petiolatis, præcipue subtus molliter fulvo-tomentosis, junioribus utrinque fulvo-tomentosis; stipulis ovatis vel lanceolatis acutis, sericeo-pilosis; racemis axillaribus 3–9-floris; floribus breviter pedicellatis; sepalis magnis lanceolatis acuminatis, anticis paullo longioribus, quam corolla paullo brevioribus; vexillo obovato, parce bilobato, unguiculato (in sicco flavo, apice purpureo), alis oblongis (in sicco flavis), unguiculatis; carina unguiculata (in sicco flava, apice purpurea); legumine sessili, subturgido, oblongo-apiculato, fulvo-hirto.

Hab. Milanji. No. 12.

Leaflets $\frac{3}{4}$–$1\frac{1}{2}$ in.; sepals $\frac{1}{2}$–$\frac{5}{8}$ in.; petals $\frac{1}{2}$ in. long; legume $\frac{1}{2}$–$\frac{5}{8}$ in. long, $\frac{1}{4}$ in. broad.

Differs from *Eriosema flemingioides*, Baker, in Trans. Linn. Soc. ser. I. xxix. t. 34, to which it is allied, by its smaller leaves, much longer sepals, and fewer-flowered racemes.

Pterocarpus melliferus, Welw.; Baker, in Oliver, Fl. Trop. Afr. ii. p. 239.

Hab. Zomba. No. 133.

"Large forest-tree with profuse flowers like a Laburnum."—*A. Whyte.*

Collected previously by Welwitsch in Lower Guinea, Pungo Andongo.

Cassia mimosoides, Linn.; Oliver, *l. c.* p. 280.

Hab. Milanji. No. 130.

Common in the Tropics of the Old World.

Cassia Petersiana, C. Bolle, in Peters, Mossamb., Bot. p. 13.

Hab. Zomba.

Distr. Mozambique District.

Brachystegia globiflora, Benth., in Hook. Icones Plant. t. 1359.

Hab. Milanji or Zomba.

The Shiré Highlands seem to be the headquarters of the genus *Brachystegia*, as Buchanan has collected two species there, *B. floribunda* and *B. longifolia*, and *B. appendiculata* was collected at Zomba by the Livingstone Expedition.

Entada abyssinica, Steud. in Schimp. Pl. Abyss. ii. p. 520.

Hab. Zomba.

Distr. Abyssinia; Angola.

Albizzia fastigiata, E. Mey.; Oliver, *l. c.* ii. p. 361.

Hab. Milanji, alt. 6000 ft.

Collected by J. Buchanan in Nyasa-land. No. 870.

Distr. Upper and Lower Guinea; Natal.

Rubus apetalus, Poir.; Oliver, Fl. Trop. Afr. ii. p. 374.
Hab. Milanji, alt. 6000 ft. No. 76.
Distr. Abyssinia; Mozambique District; Madagascar; Mascarene Islands.

Rubus huillensis, Welw.; Oliver, *l. c.* ii. p. 375.
Hab. Milanji.
Distr. Angola.

Alchemilla, sp.
Hab. Milanji, alt. 6000 ft. No. 112.

Cliffortia linearifolia, Eck. & Zeyh.; Oliver, *l. c.* ii. p. 379.
Hab. Milanji.
Distr. Angola; Natal; Cape.

Choristylis shirensis, Baker fil., n. sp. (Plate III. figs. 1–6.) Ramis ligneis, inferne glabris, superne minute puberulis; foliis alternis, coriaceis, petiolatis, lanceolatis vel anguste ovatis acutis vel acuminatis, serratis, penninervatis, basi rotundatis vel late cuneatis, utrinque glabris; petiolis minute puberulis, quam lamina brevioribus; floribus axillaribus dense paniculatis, paniculis foliis brevioribus; calycis tubo obconico, lobis lanceolatis persistentibus; petalis lanceolatis vel late subulatis, utrinque pubescentibus, sepalis paullo longioribus; staminibus 5; stylis 2 brevibus, stigmatibus globosis, ovariis semi-inferioribus; capsulis bilocularibus dehiscentibus, seminibus oblongis.
Hab. Milanji, alt. 6000 ft. No. 53.
Leaves $1\frac{1}{2}$–$2\frac{1}{4}$ in. long, $\frac{5}{8}$ in. to nearly 1 in. broad.
Collected also by J. Buchanan in the Shiré Highlands, Nos. 158 and 1468.

This is the second species of a formerly monotypic genus. *Choristylis rhamnoides*, Harv. Fl. Capensis, ii. p. 308, comes from Natal, and has broader and not such pointed leaves as the plant described above.

Tillæa aquatica, Linn.; Britten, in Oliver, Fl. Trop. Afr. ii. p. 388.
Hab. Milanji. No. 95.
Occurs also in North Europe and Germany.

Crassula globularioides, Britten, *l. c.* ii. p. 389.
Hab. Milanji, alt. 6000 ft. No. 158.
Collected previously by Dr. Meller on Mt. Chiradzura.

Myrothamnus flabellifolia, Welw.; Oliver, Fl. Trop. Afr. ii. p. 404; Trans. Linn. Soc. ser. I. xxvii. p. 23, t. 8.
Hab. Milanji, 6000 ft.
Occurs also in Lower Guinea and at the Cape.

Dissotis incana, Triana in Trans. Linn. Soc. ser. I. xxviii. p. 58; Cogn. Melastomaceæ, p. 370.

Dissotis canescens, Hook. f., in Oliver, Flora of Trop. Africa, ii. p. 453.
Osbeckia canescens, E. Mey.; Graham in Bot. Mag. t. 3790.

Hab. Milanji. No. 168.
Distr. Nile land; Natal; Transvaal.

Dissotis princeps, Triana in Trans. Linn. Soc. ser. I. xxviii. p. 57; Cogn. Melastomaceæ, p. 375.

Dissotis eximia, Hook. f., in Oliver, Flora of Trop. Africa, ii. p. 454.

Hab. Milanji, 6000 ft. No. 103. Zomba.
Distr. Central Africa; Mozambique District; Zambesi-land; Natal.

Dissotis Johnstoniana, Baker fil., n. sp. (Plate II. figs. 13–17.) Ramis robustis elongatis, plus minusve scabridis, ad nodos parce incrassatis, setosis, obscure tetragonis; foliis petiolatis, coriaceis, ovatis acutis vel acuminatis, basi rotundatis, utrinque scabridis, palmatim 5-nervatis, petiolis scabridis; floribus terminalibus paniculatis; pedicellis glabris; calycis tubo angulato, sparse hirto, tamen glabro vel subglabro, lobis 5 ovatis vel oblongis, margine ciliatis, persistentibus; petalis magnis obovatis (in sicco purpureo-violaceis); staminibus inæqualibus, connectivo magno ad basin producto; stylis staminibus longioribus; stigmate clavato curvato; capsulis 5-valvis, ad apicem setis albis coronatis.

Hab. Milanji, alt. 6000 ft. No. 74.

Leaves 2–3 in. long, petioles $\frac{1}{2}$–$\frac{2}{3}$ in., petals 1 in. long.

The flowers of this plant are pentamerous and panicled.

This plant has been named in honour of Commissioner H. H. Johnston, the organizer of the expedition.

Homalium africanum, Benth. in Journ. Linn. Soc. iv. p. 35.
Hab. Milanji.
Distr. Upper Guinea.

Wormskioldia longipedunculata, Mast. in Oliver, Fl. Trop. Afr. ii. p. 502.
Hab. Milanji, alt. 3000–6000 ft. No. 97.
Distr. Mozambique District.

Tryphostemma apetalum, Baker fil., n. sp. (Plate III. figs. 7–11.) Herbaceum, erectum, cirrhiferum, glaberrimum, glaucum; foliis petiolatis, lanceolatis vel anguste lanceolatis, apice mucronatis, serratis, ad basin laminæ appendiculatis; stipulis parvis, linearibus, subulatis; appendiculis stipuliformibus 2 magnis, crescentiformibus, serratis, supra pedunculos e caule exorientibus; ramulis floriferis gracilibus, strictis, erecto-patentibus, quam folia duplo brevioribus, 1–2-floris, supra florum insertionem subito attenuatis, demum iterum incrassatis, in cirrhum simplicem exeuntibus;

pedicellis gracillimis ad basin appendiculatis; sepalis 5 obtusis (in sicco flavo-viridibus); petalis nullis; corona exteriore gamophylla, cylindracea, ore longe fimbriata, corona interiore annulari brevissima; staminibus inclusis; stylis præcipue post anthesin exsertis, divergentibus, filiformibus; stigmatibus clavatiformibus; fructu pericarpio chartaceo ovoideo; seminibus fere ellipticis applanatis.

Hab. Zomba.

Stem 1–1½ ft. high; leaves 2 in. to nearly 3 in. long, ⅛ in. to nearly ½ in. broad; peduncles ⅜ in. long.

This plant resembles *Tryphostemma zanzibaricum,* Mast. in Oliver, Fl. Trop. Afr. ii. p. 508, in the structure of its flowers. Engler, in the 'Botanische Jahrbücher' for 1892, revises the genus *Tryphostemma*, proposing the sections *Eutryphostemma*, *Neotryphostemma*, and *Basananthe*, this last section, consisting of West-tropical African plants, having been formerly kept up as a genus.

T. apetalum will belong to the section *Eutryphostemma*; but the peduncles are 1–2-flowered, and not 3-flowered. The stipuliform appendages referred to in the description are organs similar to those found in *T. triloba*, Bolus in Hook. Icones Plant. t. 1838, where, however, they are described as stipules; their point of insertion is above the peduncle.

Momordica fœtida, Schum. et Thonn. Pl. Guin. p. 426.

Hab. Zomba.

Distr. Abyssinia; Cordofan; Central Africa; Guinea; Fernando Po; Natal.

Hydrocotyle asiatica, Linn.; Hiern, in Oliver, Fl. Trop. Afr. iii. p. 6.

Hab. Milanji, alt. 6000 ft. No. 197.

Widely spread in Tropical and Subtropical regions.

Physotrichia Buchanani, Benth. in Hook. Icones Plant. t. 1358.

Hab. Milanji. No. 14.

Gathered on Zomba by Buchanan and Sir J. Kirk.

Peucedanum, sp.

Hab. Milanji, alt. 6000 ft.

Caucalis melanantha, Benth. & Hook. fil.; Hiern, in Oliver, Fl. Trop. Afr. iii. p. 26.

Hab. Milanji. No. 121.

Distr. Abyssinia, alt. 9300 ft. (*Schimper*); Camaroons, alt. 7000–9000 ft., Kilimanjaro; Masai Country; Kapte Plateau, 5000–6000 ft.; Plateau, Lake Nyasa; also in Madagascar.

Caucalis pedunculata, Baker fil., n. sp. *C.* radice crassa; caule adscendente, canaliculato, albo-piloso; foliis ovatis, bipinnatifidis, segmentis oblongis acutis, incisis, inferioribus distincte petiolatis, vagina membranacea, venosa, magne dilatata, margine albo-pilosa; umbellis terminalibus, involucri et involucelli bracteis lineari-

lanceolatis; floribus parvis (in sicco flavo-viridibus); petalis obovatis; fructu flavo-viridi cum setis paulum pallidioribus, vittis primariis haud prominentibus setis brevibus armatis, vittis secondariis setis glochidiatis longioribus armatis.

Hab. Milanji. No. 160.

Fruit $\frac{1}{4}$ in. long.

This plant was also collected at Blantyre by L. Scott, in Oct. 1887, and near Muata Menya, Zambesia, alt. 4000 ft., by Sir J. Kirk.

Differs from *C. melanantha*, Benth. et Hook. fil., in having the secondary umbels borne on peduncles of half an inch in length and in the flowers being a different colour. *C. melanantha* has dark purple flowers.

Cussonia, sp.

Hab. Milanji, alt. 6000 ft. No. 54.

MONOPETALÆ. (By James Britten, F.L.S.)

(Acanthaceæ, by S. Moore, F.L.S.; Royena, by W. P. Hiern, M.A., F.L.S.; Selago, by R. A. Rolfe, A.L.S.)

Pentas* purpurea, Oliver, in Trans. Linn. Soc. ser. I. xxix. p. 83, vel aff.

Hab. Milanji, 6000 ft.

Otomeria dilatata, Hiern, in Oliver, Fl. Trop. Afr. iii. p. 50.

Hab. Zomba; Milanji, 6000 ft. No. 139.

Pentodon decumbens, Hochst. in Flora, 1844, p. 552.

Hab. Zomba.

Oldenlandia (cf. *O. caffra*, Eckl. & Zeyh.).

Hab. Milanji.

Oldenlandia Oliveriana, K. Schum. in Engl. Hochgebirgsflora, p. 397.

Hab. Milanji, 6000 ft. Nos. 126, 146, 177.

Psychotria hirtella, Oliver, in Trans. Linn. Soc. ser. II. ii. p. 336.

Hab. Milanji.

Anthospermum Whyteanum, Britten, sp. n. Suffruticosum, virgatum; caule erecto, 1–1½-pedali, inferne nudo, superne dense ramoso; ramis erectis vel adscendentibus, brevibus, dense floriferis, ramis superioribus post anthesin ad 1½–3 poll. productis;

* It may be worth while noting that *Pentas mombassana*, Hiern, mentioned by Prof. Oliver in Trans. Linn. Soc. ser. II. ii. p. 335, is a MS. name in the Kew Herbarium for the plant subsequently published by Mr. Hiern (Journ. Linn. Soc. xvi. p. 262) as *P. parvifolia*.

foliosis, sæpe ramulosis; foliis lanceolatis acutis, $\frac{1}{4}$–$\frac{1}{3}$ poll. longis, verticillatis vel fastigiatis, marginibus revolutis, hirtis; fructibus minimis, 1–3nis, obovato-cuneatis, hirsutis, in axillis profunde insertis. Flores non vidi.

Hab. Milanji. No. 48.

An erect woody undershrub; stems bare below, with numerous usually short branches above, densely covered with inflorescence in the lower portion and continued into barren leafy shoots $1\frac{1}{2}$–3 in. long; the leaves and branches are clothed with short hairs. Approaching *A. emirnense* in habit, but readily distinguished by the long terminal leafy shoots.

Anthospermum lanceolatum, Thunb. Prod. Pl. Cap. p. 32.

Hab. Milanji.

Widely distributed in South Africa.

Spermacoce dibrachiata, Oliver, in Trans. Linn. Soc. ser. I. xxix. p. 88.

Hab. Milanji, 6000 ft. Nos. 144, 162.

Galium Aparine, Linn. Sp. Pl. p. 108.

Hab. Milanji. No. 132.

A mere fragment, probably of this species.

Valeriana capensis, Thunb. Prod. Pl. Cap. p. 7.

Hab. Milanji, 6000 ft. No. 114.

The specimens differ from South African examples in the greater length of the elongated terminal leaflet, but I do not find other differences. The genus has hitherto been recorded from Tropical Africa only by Prof. Oliver (Trans. Linn. Soc. ser. II. ii. p. 337), who had a single flowering specimen, insufficient for description, from Kilimanjaro.

Bothriocline Schimperi, Oliver, var. longipes, Oliver & Hiern, in Fl. Trop. Afr. iii. p. 266.

Hab. Milanji, 6000 ft. Nos. 40, 125.

Vernonia marginata, Oliver & Hiern, *l. c.* iii. p. 278.

Hab. Zomba.

Vernonia pteropoda, Oliver & Hiern, *l. c.* iii. p. 283.

Hab. Milanji, 6000 ft.

Vernonia glabra, Vatke, in Oesterr. Bot. Zeitschr. xxvii. p. 194.

Hab. Milanji, 6000 ft.

Vernonia Poskeana, Vatke & Hildebr. *l. c.* xxv. p. 324.

Hab. Milanji, 6000 ft. Nos. 98, 179, 190.

Vernonia (§ Stengelia) Whyteana, Britten, sp. n. Frutex erectus; ramis subangulosis, rigidis, tomentosis; foliis 2–3 poll. longis, petiolatis, superioribus sub-

sessilibus, cordato-ovatis acutis, irregulariter dentatis, superne puberulis, subtus cano-tomentosis, venis conspicuis; petiolis 1 poll. long.; pedunculis robustis; capitulis paucis (4–5) in cymis terminalibus corymbosis, late campanulatis, $1\frac{1}{2}$–2 poll. diam.; involucri squamis multiseriatis, lævibus, fusco-viridibus, late triangulatis, irregulariter crenato-dentatis, acutis, exterioribus recurvis, interioribus erectis lanceolatis, corneis, obtusatis, pappo proxime æquantibus; pappo stramineo, achenis fuscis. Corollam non vidi.

Hab. Zomba.

A fine species, near *V. adoensis*, Sch. Bip., and *V. drymaria*, Klatt. The specimens are all in fruit; but in general appearance this species is very distinct from any that I have seen, and the shape of the leaves distinguishes it at once from its allies.

VERNONIA NATALENSIS, Sch. Bip. in Walp. Repert. ii. p. 947.

Hab. Zomba and Milanji (*Whyte*); Angola (*Welwitsch*, No. 3338).

VERNONIA NATALENSIS, var.

Hab. Milanji.

Upper surface of the leaves green and nearly glabrous, underside silvery; midrib conspicuous; margin more or less revolute; involucral scales short, broad, mucronate, with dark tips. Possibly a distinct species, between *V. natalensis* and *V. pinifolia*.

AGERATUM CONYZOIDES, Linn. Sp. Pl. p. 839.

Hab. Milanji. No. 187.

EUPATORIUM AFRICANUM, Oliver & Hiern, in Fl. Trop. Afr. iii. p. 301.

Hab. Milanji. Nos. 66, 106; Zomba.

DICHROCEPHALA LATIFOLIA, DC. in Guill. Archiv. Bot. ii. p. 518.

Hab. Milanji.

NIDORELLA MICROCEPHALA, Steetz, in Peters, Mossamb., Bot. p. 406.

Hab. Milanji, No. 67; Zomba.

CONYZA VARIEGATA, Sch. Bip. ex A. Rich. Tent. Fl. Abyss. i. p. 388.

Hab. Milanji.

CONYZA ÆGYPTIACA, Ait. Hort. Kew, iii. p. 183.

Hab. Milanji, 6000 ft. No. 153.

BLUMEA LACERA, DC. in Wight, Contrib. Bot. Ind. p. 14.

Hab. Zomba.

ACHYROCLINE HOCHSTETTERI, Sch. Bip. ex A. Rich. Tent. Fl. Abyss. i. p. 429.

Hab. Milanji, 6000 ft. No. 107.

ACHYROCLINE SCHIMPERI, Sch. Bip. *l. c.* p. 428.

Hab. Milanji.

GNAPHALIUM LUTEO-ALBUM, Linn. Sp. Pl. p. 851.
Hab. Milanji.

HELICHRYSUM CYMOSUM, D. Don in Mem. Wern. Soc. v. p. 550, var.?
Hab. Milanji, 6000 ft. No. 32.

HELICHRYSUM NITENS, Oliver & Hiern, in Fl. Trop. Afr. iii. p. 350.
Hab. Milanji plateau, 7000 ft. No. 28.

HELICHRYSUM BUCHANANI, Engl. Hochgebirgsflora, p. 429.
Hab. Milanji, 6000 ft. No. 134.

"The natives resort to the plateau of Milanji periodically to manufacture salt from this plant, which grows on the poor gravelly ground of the ridges on the plain."—*A. Whyte.*

HELICHRYSUM NUDIFOLIUM, Less. Syn. Comp. p. 299.
Hab. Milanji.

HELICHRYSUM WHYTEANUM, Britten, sp. n. Fruticosa, ramosa; ramis lignosis, foliosis, albo-tomentosis; foliis lineari-oblongis vel lanceolatis, coriaceis, acutis, amplexicaulibus, superne glabris, subtus albo-lanatis, marginibus recurvatis, $\frac{1}{2}$–1 poll. long., $\frac{1}{24}$–$\frac{1}{6}$ poll. lat.; capitulis late campanulatis, solitariis vel 2–5nis, sessilibus vel breviter pedunculatis, argenteis, 1 poll. latis; involucri bracteis multiseriatis, lanceolatis obtusis.

Hab. Milanji plateau, 6000–8000 ft. (*Whyte*, No. 27); Nyasa-land (*Buchanan*, No. 950) (1891).

A handsome plant, near *H. Newii*, Oliver & Hiern, in Fl. Trop. Afr. iii. p. 349, and *H. Hohnelii*, Schweinf. in Hohnel, Rudolph-See, p. 862. The young branches are leafy throughout, the older ones bare and almost glabrous below, with conspicuous leaf-scars.

HELICHRYSUM MILANJIENSE, Britten, sp. n. Fruticosa, ramosa; ramis erectis, monocephalis; foliis lineari-acutis, amplexicaulibus, adpressis, inferioribus recurvatis, superioribus patentibus, subtus laxe albo-lanatis, marginibus revolutis; capitulis campanulatis, sessilibus, luteis, $\frac{1}{2}$ poll. longis, $\frac{2}{3}$ poll. latis; involucri bracteis ovato-lanceolatis acutis.

Hab. Milanji plateau, 6000 ft. No. 52.

Resembling *H. Kirkii*, but distinguished at once by the monocephalous branches all springing from near the root. Leaves about 1 inch long, closely adpressed to the stem for a third of their length, the lower recurved; heads shining dull yellow.

HELICHRYSUM DENSIFLORUM, Oliver, in Hook. Ic. Plant. t. 2286.
Hab. Milanji, 6000 ft. (*Whyte*, No. 118); Nyasa-land (*Buchanan*, No. 933).

HELICHRYSUM LATIFOLIUM, Less. Syn. Comp. p. 297.
Hab. Milanji, 6000 ft.

A Cape species, to which I refer the plant from Zambesi (*Stewart*) placed in Fl. Trop. Afr. iii. p. 353 as a form of *H. gerberæfolium*.

Helichrysum gerberæfolium, Sch. Bip. ex A. Rich. Tent. Fl. Abyss. i. p. 425.
Hab. Milanji, 6000 ft. No. 80.

Helichrysum undatum, Less. Syn. Comp. p. 298.
Hab. Zomba.

Helichrysum auriculatum, Less. Syn. Comp. p. 311.
Hab. Zomba.

Athrixia rosmarinifolia, Oliver & Hiern, in Fl. Trop. Afr. iii. p. 355.
Hab. Milanji, 6000 ft. No. 58.

Epallage dentata, DC. Prod. vi. p. 4.
Hab. Milanji, 6000 ft. No. 37.

A common and variable Malagasy species; genus not, I think, hitherto reported from the mainland.

Blainvillea Gayana, Cass. in Dict. Sc. Nat. xlvii. p. 90.
Hab. Milanji, 6000 ft. No. 94.

Melanthera abyssinica, Oliver & Hiern, in Fl. Trop. Afr. iii. p. 382.
Hab. Zomba.

Melanthera Brownei, Sch. Bip. in Flora, 1844, p. 673.
Hab. Zomba.

Spilanthes Acmella, Linn. Syst. Nat. ed. XIII. ii. p. 618.
Hab. Milanji.

Bidens pilosa, Linn. Sp. Pl. p. 832.
Hab. Milanji, 6000 ft.

Gynura cernua, Benth. in Hook. Niger Flora, p. 437.
Hab. Zomba.

Gynura amplexicaulis, Oliver & Hiern, in Fl. Trop. Afr. iii. p. 403.
Hab. Milanji.

Gynura crepidioides, Benth. in Hook. Niger Flora, p. 438.
Hab. Milanji, 6000 ft. No. 176.

Cineraria kilimanscharica, Engl. Hochgebirgsflora, p. 439.
Hab. Milanji, 6000 ft. No. 132.

To this is to be referred "*Cineraria abyssinica*, Sch. Bip., forma," of Mr. H. H. Johnston's Kilima-njaro collections (Trans. Linn. Soc. ser. II. ii. p. 340).

Senecio latifolius, DC. Prod. vi. p. 387. (*S. bupleuroides*, DC.)
Hab. Milanji, 6000 ft. Nos. 70, 109; Zomba.

Senecio lasiorhizus, DC.? *l. c.*
Hab. Milanji.

Senecio Whyteanus, Britten, sp. n. Perennis, glaber, rhizomate obliquo; caule erecto, herbaceo, striato-sulcato, 1–3-pedali; foliis inferioribus petiolatis, petiolo 1–2 poll. longo, decurrente, basi amplexicauli, lamina $1\frac{1}{2}$–3 poll. longa × 1 poll. lata, ovatis vel lanceolatis acutis, crenato-serratis, margine glandulosis; foliis superioribus lanceolatis, subintegris, 1 poll. longis, bracteiformibus; panicula corymbosa, laxa; pedicellis elongatis, patentibus, paucis; capitulis in quoque pedicello solitariis suffultis multifloris, magnis, 1 poll. latis; bracteolis lineari-lanceolatis acutis; involucro multibracteato; bracteis lanceolatis acutis, 4–5 lin. longis, margine scarioso; ligulis luteis, paucis, magnis, striatis, quam involucra duplo longioribus, 2 lin. latis.
Hab. Milanji, 6000 ft. No. 109.

Habit of *S. lasiorhizus*, DC., to which it bears considerable general resemblance. Leaves mostly from the rootstock or lower portion of the stem, passing into narrow almost entire bracts; the teeth tipped with large cushion-like glands; panicle lax, capitula few, solitary, on ascending peduncles, 3–6 inches long.

Senecio auriculatissimus, Britten, sp. n. Fruticosa, scandens, glabra; foliis auriculatis; auriculis magnis, simplicibus, integris, ovato-cordatis, amplexicaulibus, $\frac{1}{2}$–1 poll. longis; lamina 1–2 poll. lata, e basi cordata obreniformis, apice late depresso vel eroso, crenato-dentato, dentibus latis obtusis truncatis, subtus pallida, venis conspicuis; inflorescentia laxe corymbosa; pedunculis bracteolatis, bracteolis subulatis; florum marginalium tubus 2 lin. longus, ligula 3–4 lin. longa; capitula late campanulata.
Hab. Milanji, No. 83; also from Makua country (*J. T. Last*, 1887) and Shiré Highlands (*Buchanan*, 1881).

Well distinguished by the very large auricles, which are often cordate at the base, assuming a 2-lobed appearance, through which the petiole is continued; the upper leaves are sometimes reduced to their auricles. I have not found ripe achenes, but Prof. Oliver places the plant in *Senecio* (Herb. Kew); it has the habit of some climbing Cinerarias.

Othonna Whyteana, Britten, sp. n. (Plate IV. figs. 1, 2.) Fruticosa vel subfruticosa, erecta, glabra, multicaulis, pedalis, superne ramosissima; ramis crebris, brevibus; foliis obovato-lanceolatis acutis, carnosis, 1–$1\frac{1}{2}$ poll. longis; paniculis elongatis foliaceis, densis; capitulis numerosis, campanulatis, nutantibus; pedunculis bracteolatis, gracilibus, patentibus vel reflexis, post anthesin elongatis, erectis; bracteis involucri 5, lanceolatis acuminatis, $\frac{1}{2}$–1 poll. longis, marginibus membranaceis; pappo

post anthesin elongato, erecto, patente, 1–1¼ poll. longo; acheniis 4 lin. longis, 2 lin. latis, costatis, glabris.

Hab. Milanji, 6000 ft. No. 62.

A very distinct species, with numerous erect wand-like stems, becoming leafless below, clothed above with obovate-lanceolate acute, fleshy, sessile leaves, tapering to the base, and short flowering branches, forming a dense, elongated, leafy panicle; peduncles slender, spreading or reflexed during flowering, afterwards stouter and erect; heads campanulate, about ½ in. long while flowering, and then nodding, afterwards erect, the upper opening first; involucral bracts 5, lanceolate-acuminate, about ½ in. long during flowering, extending to 1 in. afterwards, with white membranous margins; pappus yellowish white, much elongated after flowering, 1–1¼ in. long, spreading, resembling a shaving-brush; achenes smooth, or with a few very short hairs.

Allied to *Othonna coriifolia* (Sond.), with which *O. Bainesii*, Oliver & Hiern, has been identified; from which, however, it is very different in general appearance, as well as in the characters given above. It is the only species peculiar to Tropical Africa.

Berkheya (§ Stobæa) Johnstoniana, Britten, sp. n. *B.* caule erecto, herbaceo, striato, irregulariter alato; foliis radicalibus et inferioribus (5–7 poll. longis, 1½ latis) pinnatifidis, subtus dense albo-tomentosis, supra viridibus dense setosis, setis luteis flaccidis, marginibus setosis vel spinellosis; petiolis decurrentibus; foliis caulinis minoribus lineari-lanceolatis; capitulis paucis (3–4), dense corymbosis, discoideis; pedunculis brevibus, post anthesin elongatis; squamis involucralibus lineari-lanceolatis, serratis, spinescentibus acutis; acheniis glabris, pappo pallide fusco.

Hab. Milanji. No. 7.

Stem herbaceous, erect, conspicuously furrowed below, less so above, irregularly winged, radical and lower stem-leaves 5–7 in. long, 1½ broad, irregularly pinnatifid, clotted beneath with white felty tomentum and above with weak yellowish spines, margins irregularly spinescent; heads small, in dense corymbs of 3-4 peduncles, elongating after flowering; flowers all discoid, purplish (?). The inflorescence, when young, resembles that of a *Cirsium*.

Berkheya subulata, Harv. in Harv. & Sond. Fl. Capensis iii. p. 507.

Hab. Zomba.

Erythrocephalum zambesianum, Oliver & Hiern, in Fl. Trop. Afr. iii. p. 441.

Hab. Milanji, 6000 ft.; Zomba.

Gerbera abyssinica, Sch. Bip. in A. Rich. Tent. Fl. Abyss. i. p. 458.

Hab. Milanji. No. 111.

Tolpis abyssinica, Sch. Bip. in Schimp. Pl. Abyss. i. No. 1?

Hab. Milanji; Zomba.

CREPIS, sp.
Hab. Milanji, 6000 ft. No. 141.

LACTUCA CAPENSIS, Thunb. Prod. Pl. Cap. p. 139.
Hab. Milanji; Zomba.

LOBELIA FERVENS, Thunb. Fl. Cap. ii. p. 46?
Hab. Milanji. No. 100.

LOBELIA, sp.
Hab. Milanji, 6000 ft. Nos. 21, 182.

WAHLENBERGIA OPPOSITIFOLIA, A. DC. Prod. vii. p. 429.
Hab. Milanji.

WAHLENBERGIA, sp.
Hab. Milanji, 6000 ft. No. 101.

LIGHTFOOTIA ABYSSINICA, Hochst. ex A. Rich. Tent. Fl. Abyss. ii. p. 1.
Hab. Milanji, No. 117; Zomba.

VACCINIUM AFRICANUM, Britten, sp. n. (Plate IV. figs. 3–5.) Frutex vel arbor parva; ramis glabris, erectis vel adscendentibus; foliis sessilibus vel breviter pedunculatis, glabris, ovatis acutis, serratis, subtus reticulatis, 2–3 poll. longis, $\frac{1}{2}$–$\frac{3}{5}$ poll. latis; racemis bracteatis, axillaribus 1–2 poll. longis; floribus pedunculatis, solitariis vel binis, nutantibus, subglobosis, calycis segmentis triangularibus, glabris, patentibus acutis; corollæ subcampanulatæ, 5-fidæ, segmentis brevibus recurvatis; staminibus corollam æquantibus vel paullo longioribus. Fructus non vidi.
Hab. Milanji, 7000–8000 ft.

This is, I believe, the first *Vaccinium* recorded from the African continent. Mr. Whyte collected it in considerable abundance, and its very numerous (white or red?) flowers doubtless render it a conspicuous figure in the landscape.

ERICA JOHNSTONIANA, Britten, sp. n. (Plate V. figs. 1–6.) Fruticulus adscendens vel erectus; folia 4-na ovata, 3–4 lin. longa, 1–1$\frac{1}{2}$ lata, dense imbricata, adscendentia, incurva, marginibus revolutis pectinatis; flores dense capitati, axillares, nutantes, breviter pedicellati; sepala lineari-lanceolata, marginibus dense hirsutis; corolla calycem æquans vel paulo excedens, campanulata; antheris appendiculatis, appendiculis tomentosis semi-orbicularibus, marginibus fimbriatis.
Hab. Milanji plateau, 6000–6500 ft. No. 4.

A low, much-branched shrub; branches especially numerous on the upper part of the stem above the flowers, erect, of a woolly appearance owing to the close aggregation at the tips of the white hairs which fringe the leaves; flowers red?, 4–12 together in dense, nodding, globose heads on short axillary branches. It seems to come nearest to *E. Solandra*, Andr.

Erica Whyteana, Britten, sp. n. (Plate VI. figs. 7–12.) Fruticulus erectus, glaberrimus, ramosus; ramulis paucis, erectis vel adscendentibus, junioribus dense foliosis; foliis 4-nis, superne aggregatis, lanceolatis, rigidis, aciculatis, 4 lin. longis, $\frac{1}{3}$ lin. latis; inflorescentia racemosa, racemis bracteatis, axillaribus paucifloris vel terminalibus, multifloris; bracteis foliaceis; floribus breviter pedicellatis, sepalis patentibus, acuminatis, 1 lin. long.; corolla urceolata, persistente, 2 lin. longa; staminibus membranaceis, inclusis, antheris magnis appendiculatis, appendiculis parvis lanceolatis.

Hab. Milanji, 6000 ft. No. 59.

A smooth plant of virgate habit, the older branches leafless, or nearly so, for more than half their length; the flowers when dry are of a brittle texture; they appear to be orange or red.

With the exception of the widely distributed *E. arborea*, I am not aware that this characteristic Cape genus has hitherto been recorded from Tropical Africa.

Philippia milanjiensis, Britten & Rendle, sp. n. Fruticulus ramulis pubescentibus; foliis 4-nis, crassiusculis, oblongo-linearibus, glabris, suberectis, breviter petiolatis; floribus parvis, ad apices ramulorum pluribus umbellatis glomeratis, breviter pedicellatis; calycis lobis 4 quam corolla brevioribus, subrotundis, unius apice elongato, crassiusculo; corollæ brevis campanulatæ lobis 4 rotundis, rubris; antheris valde exsertis, liberis; ovario subgloboso, albo-incano; stigmate magno, peltato.

A much-branched shrub, the slender ultimate branches finely pubescent; the leaves are arranged in fours, deciduous, glabrous, and 1–1$\frac{1}{2}$ lines long. One of the sepals is produced into a short, rather thick tail; the reddish corolla is $\frac{1}{2}$ line long; the strongly exserted stamens are $\frac{2}{3}$ line long, the anther $\frac{1}{2}$ line. The ovary is $\frac{1}{2}$ line long, subglobose, and covered with short white hairs. The stigma is large and capitate.

Hab. Milanji, 6000–8000 ft.

Philippia benguellensis, Welw. in herb. (*Salaxis benguellensis,* Engl. Hochgebirgsflora, p. 328.)

Hab. Milanji, 7000 ft. No. 31.

I do not know why Prof. Engler removes this from *Philippia,* in which genus Welwitsch, after careful examination, had placed it. In the absence of ripe fruit, it is impossible to say in which genus the plant should rest, but the general facies and the distribution of the genus induce me to leave it in *Philippia.* The clavis character in Gen. Plant.—"Stamina 4"—would exclude it from *Salaxis,* but in the full description of that genus we read "Stamina 6–8."

Welwitsch notes that this is called by the Portuguese colonists "Cedro pequeno" or "Cedro pequinino." Mr. Whyte has a specimen which is only in bud, but seems to be a new *Philippia,* which he labels as the foliage of a Cypress.

Blaeria setulosa, Welw. ex Engl. Hochgebirgsflora, p. 328.

Hab. Milanji plateau, 6000–7000 ft. No. 26.

ROYENA WHYTEANA, Hiern, sp. n. Foliis lanceolatis vel anguste ovali-ovatis, tenuiter coriaceis, margine sericeo-setoso, basi subcordatis, breviter petiolatis; floribus solitariis, 6–7-meris; calyce semi-fisso, lobis lanceolatis vel ovatis; staminibus 8; ovario (in floribus masculis rudimentario ?) piloso, in stylis 2 desinente.

Branches dark ashy; towards the extremities dark ferruginous and hispid, leafy. Leaves (of the young shoots) alternate, entire, lanceolate or narrowly oval-ovate, somewhat cordate at base, acutely pointed at apex, thinly coriaceous; silky, with pale tawny setose hairs on the margin and on the midrib both above and below; $1\frac{1}{4}$–$1\frac{3}{4}$ in. long by $\frac{2}{5}$–$\frac{3}{5}$ in. broad; midrib depressed above; petiole $\frac{1}{12}$–$\frac{1}{8}$ in. long, clothed with tawny setose hairs. Flowers solitary. Peduncle axillary, about $\frac{3}{4}$ in. long, clothed with tawny setose hairs, bracteate about the middle; bracts opposite or solitary, sessile, lanceolate, glabrous above, clothed beneath with tawny hairs, about $\frac{1}{3}$ in. long. Calyx hemispherical, 6–7-cleft, setose towards the base, $\frac{1}{4}$ in. long; teeth lanceolate or ovate, acute. Corolla $\frac{3}{8}$ in. long, deeply divided; lobes 6, glabrous, oblong or slightly obovate, obtusely pointed, net-veined, reflexed. Stamens 8, $\frac{3}{16}$–$\frac{1}{5}$ in. long; anthers narrowly linear-lanceolate, somewhat hairy at the back upwards, filaments very short. Ovary hairy, narrow (rudimentary ?); styles 2, glabrous.

Hab. Milanji.

The affinity of the species is with *R. scabrida*, Harv.

TABERNÆMONTANA VENTRICOSA, Hochst. ex DC. Prod. viii. p. 366.

Hab. Milanji. No. 188.

TABERNÆMONTANA STAPFIANA, Britten, sp. n. Foliis coriaceis oblongo-ellipticis, basi acutis, apice obtusis, 5–7 poll. longis, 2–3 poll. latis, nervis lateralibus prominentibus 12–14; floribus corymbose-paniculatis, paniculis in foliorum anni præcedentis axillis, pedunculo pedicellisque crassis, calyce 5-lineo, corollæ tubo pollicari subcylindrico, medio minus quam in *T. angolensi* ampliato, lobis late-obovatis vel suborbicularibus, 16 lin. longis, 10–12 latis, apice rotundis, staminibus infra medium insertis fauces minime attingentibus, 5 lin. longis.

Hab. Milanji, 6000 ft. No. 87.

Differs from *T. angolensis*, Stapf (Kew Bulletin of Miscellaneous Information, 1894, p. 23), in the more prominently-nerved leaves, thicker pedicels, and larger flowers. I have named this species after Dr. O. Stapf, to whom I am indebted for pointing out its affinity with his recently described *T. angolensis*. In that description he makes no reference to the fruit, which is absent both from the British Museum and Kew specimens. The plant is the "No. 55 (Apocynaceæ)" of the *Apontamentos* (p. 588), where the fruit is described as "fructus follicularis geminatus, mole, forma, et colore fruct. citr. aurantii. Semina membranis suberosis involuta (in optimo statu!)." To the specimen in the British Museum, where we have a complete transcript of all Welwitsch's notes, is attached a similar description, with the addition of "Flores et fructus maturos et immaturos sæpius eodem tempore fert."

MASCARENHASIA VARIEGATA, Britten & Rendle, sp. n. (Plate VI. figs. 1–3.) Frutex glaber, ramosus; foliis breviter petiolatis, ovalibus vel ovali-oblongis, subacuminatis vel obtusiusculis, rigide coriaceis, sæpe variegatis; floribus pedicellatis, interdum terminalibus et solitariis, interdum paucis in stirpibus brevibus axillaribus vel terminalibus fasciculatis; calycis lobis ovatis, intus glanduliferis; corollæ hypercrateriformis tubo supra medium, ad antherarum situm, dilatato, campanuliformi, lobis patentibus late ovatis, apice acuminatis, intus papillosis; antheris sagittatis, filamentis brevissimis; disci squamis planis, crassis, 4 per paria connatis, quinta libera, carpella distincta superantibus; carpellorum parte superiore et stylo filiformi pilis fulvis indutis.

The shoots are hard and woody; the leaves vary in size from $3\frac{1}{2}$ to $5\frac{1}{2}$ in. long, and $\frac{3}{4}$ to $1\frac{1}{2}$ in. broad, the larger ones are markedly variegated. The flowers are terminal and solitary, or 4–6 are crowded on a short terminal or axillary shoot, giving the appearance of an umbel; the pedicel of the open flower is about $\frac{1}{4}$ in. long. The calyx is 1 line long, and bears, inside at the base of the lobe, a ring of short, closely set, blunt, tooth-like glands. The corolla-tube is 5 lines long, and tapers slightly from below upwards to the middle, where it becomes dilated and campanulate; at the dilated portion, which represents the insertion of the stamens, it is $1\frac{1}{2}$ lines in diameter. The spreading corolla-lobes are $3\frac{1}{2}$ lines long by $2\frac{1}{2}$ broad, and have a marked acuminate apex. The narrow sagittate anthers are $1\frac{3}{4}$ lines long. A divergence from the generic diagnosis in the 'Genera Plantarum' occurs in the fact that the disk-scales overtop the ovary. The latter is covered on the upper half with stiff yellowish hairs, and similar but shorter hairs clothe the thin style. Fruit not seen.

Agrees in many points with Baker's description of *M. micrantha*, but the leaves are much larger and narrower in proportion; the flowers are also larger and have a much longer tube, that of *M. micrantha* being only twice the length of the calyx, which is 1 line long; the limb of *M. micrantha* is only $\frac{1}{4}$ in. across, that of *M. variegata* nearly $\frac{3}{4}$ in.

By the discovery of the present species, the genus *Mascarenhasia*, hitherto known only from Madagascar, is extended to the mainland.

Hab. Milanji, 6000 ft., Oct. No. 108.

ECTADIOPSIS WELWITSCHII, Baill. in Bull. Soc. Linn. Paris, ii. p. 803.

Hab. Milanji. No. 134.

SCHIZOGLOSSUM NYASÆ, Britten & Rendle, sp. n. Suffrutex caule erecto, simplici, pubescente; foliis sessilibus, cuneatis vel cuneato-oblongis, apice mucronulatis, utrinque glabris vel basi et marginibus revolutis, puberulis; inflorescentia terminali umbellis pluribus lateralibus aucta; bracteis subulatis, puberulis, quam florum pedicelli puberuli brevioribus; sepalis subulatis, sparse puberulis; petalis ovato-oblongis, multinerviis, dorso glabris, intus papillosis; coronæ lobis gynostegium superantibus planis, trilobatis, medio incrassatis, geminis appendiculis tenuibus suffultis;

gynostegio subsessili, coronæ lobis duplo breviore; styli apice pentagono, medio umbonato; antherarum connectivo apice membranaceo expanso, super stylum revoluto.

The single specimen is 32 in. high; the soft, woody, cylindrical, hollow stem $2\frac{1}{2}$ lines in diameter for the lower 18 in., tapering gradually above in the flowering portion. The leaves are $1\frac{1}{4}$–$1\frac{1}{2}$ in. long and 4–5 lines at the broadest part, with a single prominent midrib and spreading lateral veins. The subulate flexible bracts are 2 lines long, the flower-pedicels 3–4 lines. The open flower measures nearly 5 lines across; the sepals are $1\frac{3}{4}$ lines long, the petals $2\frac{1}{2}$ lines by 1 broad; the corona-segments $1\frac{2}{3}$ lines long, with a broad trilobed apex, the lateral lobes being short and rounded, and the central one more than twice as long and acute, and exceeding the acute subfalcate appendages.

Hab. Milanji, Oct.

SCHIZOGLOSSUM BARBATUM, Britten & Rendle, sp. n. Suffrutex caulibus e rhizomate crassiusculo ligneo pluribus tenuibus, sæpissime simplicibus, puberulis; foliis linearibus vel lineari-lanceolatis acutis, subglabris vel sparse puberulis, margine revolutis; inflorescentia umbellis pluribus, terminali; bracteis parvis, filiformibus, deciduis; florum pedicellis tenuibus, puberulis; corollæ rotatæ lobis anguste ovatis, subacutis, reflexis, superne puberulis, dorso glabris; sepalis subulatis, superne glabris, dorso et margine sparse puberulis; coronæ segmentis planis, intus medio bicarinatis, apice in caudam crassam, acuminatam, e flore exsertam productis; gynostegio subsessili, styli apice plano pentagono; antherarum connectivo velut in specie præcedente.

The slender stems are 7–9 in. long, the lower leaves an inch or less in length, the upper 2–$2\frac{3}{4}$ in. The minute filiform bracts are 1 line long, the flower pedicels 3–4 lines. The open flower is 3–4 lines across; the sepals $1\frac{1}{2}$ lines long, the corolla-lobes 2 lines long by 1 line broad. The corona-segments are 2 lines long, the flexuose exserted tails often $1\frac{1}{2}$ lines.

This is at once distinguished from the preceding species by its thin stems, narrow leaves, and terminal inflorescence, and the shape of the corona-segments with their long and conspicuous tails. It seems near *S. elatum*, K. Schum. (Engl. Bot. Jahrb. xvii. p. 123), judging from the description, but differs in having broader leaves, a terminal inflorescence, flowers twice the size, and very long corona-tails.

Hab. Milanji, 6000 ft., Oct.

STATHMOSTELMA REFLEXUM, Britten & Rendle, sp. n.. (Plate VI. figs. 4–6.) Suffrutex caulibus erectis, strictis, super basin teretem complanatis, glabris, apice puberulis; foliis subsessilibus, lineari-lanceolatis, elongatis, acutis, glabris, margine recurvatis, subscabridis; inflorescentia umbellata, terminali, simplici vel interdum ramo laterali; umbella 4-flora; pedicellis tenuibus puberulis; sepalis parvis, lanceolatis, acutis, dorso puberulis; corollæ abrupte reflexæ, pallidæ, lobis ovatis, tubo brevi;

coronæ lobis petaloideis, aurantiacis, gynostegium alte superantibus, oblongis, cucullatis, apice integris, medio dentibus binis productis et e cavitate appendiculam falcatam emittentibus; styli apice orbiculari, 5-lobulato, medio depresso.

The generally simple stems are 13–22 in. long; the slender flaccid leaves have a midrib prominent on the lower surface and slightly puberulous, with no other venation visible; the length varies considerably, from $2\frac{1}{2}$ to 6 in., and the breadth from $1\frac{1}{2}$ to $2\frac{1}{2}$ lines. The flower-pedicels are slender, 8–9 lines long; the bracts have fallen. The flowers measure 4 lines across; the small sepals (1 line long) are quite hidden by the corolla, which is abruptly reflexed almost at its base; the short corolla-tube is $\frac{3}{4}$ line long, the ovate lobes 3 lines by $1\frac{3}{4}$ broad. The large bright orange corona-segments are $3\frac{1}{2}$ lines long, and stand erect above the petals. The arms of the pollen-carriers gradually broaden from the attachment, forming a wide upper membranous portion with an incurving lower edge; the small pollinia-bearing portion is attached to this by an acuminate apex.

The species is near *S. incarnatum*, K. Schum. in Engl. Bot. Jahrb. xvii. p. 130, but distinguished by the oblong corona-lobe with its entire apex, that of *S. incarnatum* being truncate and subtrilobate; the appendage is also much larger, projecting beyond the cavity, whereas in *S. incarnatum* it is small and hidden in the cavity; the arms of the pollen-carriers are also narrower in the Milanji species.*

Hab. Milanji, Oct.

* The following new species of this genus collected by Dr. Welwitsch, may be described here:—

STATHMOSTELMA WELWITSCHII, Britten & Rendle. Suffrutex perennis, tubere duro napiformi, valde lactescens; caulibus erectis, teretibus, glabris, ramosis; foliis elongatis, lineari-lanceolatis, viridi-subglaucescentibus, subcarnosulis; inflorescentia umbellata; umbellis 2–6-floris; pedicellis puberulis; sepalis ovati-lanceolatis, acutis, subpuberulis; corollæ rotatæ, intense aurantiacæ, tubo perbrevi, lobis ovalibus acutis; coronæ lobis petaloideis, gynostegium valde superantibus, oblongis, apice truncatis, cucullatis, dentibus binis acutis lateralibus sub cuculla instructis et medio appendiculam truncatam emittentibus, inferne carinatis; gynostegio altiuscule pedicellato; translatorum brachiis oblongis, basi inflexis, subito in filum tenue contractis, iterum in aream triangularem polliniferam dilatatis.

The plant is $2\frac{1}{2}$–4 ft. high; the leaves closely resemble those of *S. reflexum*, but are slightly broader and less flaccid; the open flowers measure a little less than an inch across, their pedicels being $\frac{3}{4}$ to $1\frac{1}{4}$ in. long. The sepals are 3 lines long by 1 broad; the short corolla-tube is $\frac{2}{3}$ line long, the spreading lobes 5 lines long by 2 broad. The truncate corona-segments are erect as in *S. reflexum* and $2\frac{1}{2}$ lines long, overtopping the stalked gynostegium; a membranous keel runs from the base of the teeth down the middle of the lobe.

In flower in January.

Distinguished from the Milanji species by its sturdier habit, larger flowers, rotate corolla, truncate corona-segments, and the shape of the arms of the translators. Is apparently near K. Schumann's *S. rhacodes*, which, however, has smaller flowers, much longer corona-segments, and the arms of the translators contracted with shoulders at the top. Decaisne's *Gomphocarpus chironioides*, in DC. Prod. viii. p. 562, may belong to this species.

Hab. Very rare in elevated sandy thickets near Pedras de Guinga, Pungo Andongo (*Welwitsch*, 'Iter Angolense,' No. 4168).

These plants belong to the genus *Stathmostelma*, recently established by Dr. K. Schumann (Engl. Bot. Jahrb. xvii. p. 129, t. 6). His diagnosis is based on the very broad arms of the pollen-carriers ("translators"), which characterize these species. Further investigation of the genera may lead, as Schumann himself points out, to a considerable reduction in their number, in which case *Stathmostelma* will probably be relegated to *Asclepias*, and our species will become respectively *A. reflexa* and *A. Welwitschii.*

GOMPHOCARPUS PALUSTRIS, K. Schum. in Engl. Bot. Jahrb. xvii. p. 127.
Hab. Zomba.

MARGARETTA ROSEA, Oliver, in Trans. Linn. Soc. ser. I. xxix. p. 111.
Hab. Milanji. Nos. 106, 117.

PERGULARIA SANGUINOLENTA, Lindl. ex Sims, in Bot. Mag. t. 2532.
Hab. Zomba.

MOSTUÆA BRUNONIS, F. Didrichs. in Vidensk. Med. Nat. For. Kjöbenh. 1853, p. 87.
Hab. Milanji.

BUDDLEA, sp.
Hab. Milanji. No. 113.

SEBÆA CRASSULÆFOLIA, Cham. & Schlecht. in Linnæa, i. 193 (*fide* Schinz).
Hab. Milanji.

TRICHODESMA PHYSALOIDES, A. DC. in Prod. x. p. 173.
Hab. Zomba.

HEWITTIA BICOLOR, Wight & Arn. in Madr. Journ. Sc. ser. I. v. (1837) 22.
Hab. Milanji.

IPOMŒA OBSCURA, Ker, in Bot. Reg. t. 239.
Hab. Zomba.

IPOMŒA FULVICAULIS, Boiss, ex Hallier in Engl. Bot. Jahrb. xviii. p. 128.
Hab. Milanji.
Our specimens have much shorter petioles than the type (Abyssinia, Schimper, Sect. i. p. 240), but agree with it in other respects.

CONVOLVULUS MALVACEUS, Oliver, in Trans. Linn. Soc. ser. I. xxix. p. 117.
Hab. Milanji. No. 108.

HALLERIA ELLIPTICA, Thunb. in Nov. Act. Ups. vi. p. 39.
Hab. Milanji.

BUCHNERA, sp.
Hab. Milanji, 6000 ft. No. 71.

CYCNIUM ADONENSE, E. Mey. ex Benth. in Comp. Bot. Mag. i. p. 368.
Hab. Milanji, 2000 ft. No. 186.

THUNBERGIA KIRKIANA, T. Anders. in Journ. Linn. Soc. vii. p. 19.
Hab. Milanji.

THUNBERGIA LANCIFOLIA, T. Anders. l. c.
Hab. Zomba.

THUNBERGIA ALATA, Boj. ex Hook. Exot. Fl. t. 177.
Hab. Milanji.

MIMULOPSIS SESAMOIDES, S. Moore, sp. n. *M.* caule ascendente? folioso, foliis pro genere magnis, longipetiolatis, e basi sat attenuata, levissime cordata, ovatis acuminatis, grosse ac impariter dentatis, membranaceis, inflorescentia e paniculis terminalibus brevibus (ac revera quam folia brevioribus) paucifloris vel elongatis et plurifloris composita; paniculi ramis bibracteatis, bracteis lineari-lanceolatis calyce brevioribus, calycis laciniis anguste linearibus elongatis, laciniis anticis quam reliqua brevioribus, lacinia postica longiore; corollæ pro genere magnæ, tubo superne gradatim amplificato, limbi lobis rotundato-ovatis, lobo antico majore, lobis reliquis subæqualibus; staminibus inclusis, filamentis per paria in membranam latam pilosam fere ad basin tubi decurrentem connatis; antheris magnis, staminum anticorum loculo altero abrupte recurvo-calcarato, altero paullo minore, mutico, staminum posticorum quam antica paullo minorum loculis muticis; disco obsoleto; ovario oblongo, basi subito incrassato; stylo piloso coronato; stigmatis lobo altero fere omnino obsoleto, altero satis elongato; ovulis quovis in loculo 4; capsula anguste oblongo-ovoidea, calycem subæquante, tetrasperma.
Hab. Milanji. No. 89.

Caulis superne ultra 0·2 cm. diam., tetragonus, arcte pubescens, mox glaber; foliorum lamina usque ad 12·0 cm. longa (folia minora vero exstant), juxta medium 6·0–6·5 cm. lata, ima basi fere ad 1·0 cm. angustata, utrinque, præsertim in nervis, minute puberula; folia subtus decoloria, juvenilia pubescentia; petioli 3·0–vix 6·0 cm. longi, pubescentes, cito puberuli; paniculæ glanduloso-piloso-pubescentes; calycis laciniæ majores 1·5–2·5 cm. longæ, obtusæ, nequaquam spathulatæ, glanduloso-pilosæ; corolla 3·0 cm. diam., forsan violacea; limbi lobus anticus 1·1 cm. latus, lobi reliqui 0·8 cm.; tubus 1·7 cm. longus, sub faucibus circa 1·5 cm. latus, deorsum ad 0·5 cm. constrictus, antice pilis decurvis longiusculis obsitus; filamenta libera complanata, staminum anticorum vix 0·6 cm. longa, staminum posticorum paullo breviora; membrana decurrens 0·6 cm. longa; antherarum apice breviter pilosarum et obtusarum loculi majores 0·6 cm. longi, calcar eorum 0·1 cm. longum, ad angulum rectum loculo insidens; ovarium 0·6 cm. longum, fere glabrum, apice obtusum; stylus 1·3 cm. attingens; stigmatis lobus alter 0·4 cm. longus, alter ad 0·02 cm. reductus; ovula 0·1 cm. diam., biserialia; capsula usque 2·5 cm. longa, breviter rostrata; semina suborbicularia, 0·7 cm. longa, 0·8 cm. lata, brunnea, lævia, retinaculis rectis sat validis 0·25 cm. longis fulta.

Species memorabilis, et ob folia magna grosse dentata necnon flores majusculos congeneribus ab omnibus plane distincta.

CROSSANDRA GREENSTOCKII, S. Moore, in Journ. Bot. 1880, p. 37.
Hab. Milanji, 6000 ft. No. 93.

ASYSTASIA COROMANDELIANA, Nees, in Wall. Pl. As. Rav. iii. p. 89.
Hab. Zomba.

BRACHYSTEPHANUS AFRICANUS, S. Moore, sp. n. *B.* caule folioso sat valido, in longitudinem striato, appresse pubescente, parumper glabro; foliis majusculis, longius- vel brevipetiolatis, ovatis, elongate caudato-acuminatis, basi in petiolum gradatim desinentibus, utrinque puberulis et in nervis pag. inf. appresse ac strigose pubescentibus; spicis ramulos laterales breves terminantibus (an unquam vere axillaribus?) elongatis, brevissime pedunculatis, vix omnino sessilibus; bracteis majusculis, imbricatis, rhombeo-ovatis, longe acuminatis, puberulis; bracteolis linearibus acuminatis, carinatis, bracteis circa duplo et calyce triplo brevioribus; calycis alte 5-partiti segmentis inæqualibus linearibus acutis; corollæ majusculæ tubo ad fauces parum ampliato, labio antico brevissime trifido, labio postico integro; staminibus longe exsertis, basi liberis; stylo exserto, stigmate capitulato coronato.
Hab. Milanji, 6000 ft. No. 56.

Caulis 0·4 cm. diam., ad nodos tumidus; internodia saltem superiora brevia, raro ultra 3·0 cm. longa (exstat vero aliud usque ad 6·0 cm.); foliorum lamina 12·0–14·0 cm. longa, 5·5–6·0 cm. lata (occurrunt equidem folia minora—3·0–6·0 cm.—majoribus mixta); petioli ad 4·0 cm. longi, fol. supremorum attamen vix 0·5 cm. attingunt; fol. omnia tenuiter membranacea, in sicco virentia; costæ secundariæ utrovis latere circa 12, alternatim insertæ, raro suboppositæ, leviter arcuatæ; costæ omnes pag. inf. marginibus elevatis pubescentibus instructæ; spicæ usque ad 22·0 cm. longæ, circa 0·7 cm. latæ, puberulæ; bracteæ circa 1·0 cm. longæ, 0·6–0·7 cm. latæ, firmæ, leviter striatæ, demum subdistantes; bracteolæ 0·5 cm. long., puberulæ; calycis segmenta duo antica reliqua paullo excedentia et revera fere 1·5 cm. longa (reliqua 1·3 cm.), omnia trinervia, dorso pubescentia; corollæ puberulæ tubus vix 3·0 cm. longus, 0·12 cm. latus, ipsis in faucibus ad 0·25 cm. amplificatus; labium anticum late ovatum, 0·8 cm. longum, 0·5 cm. latum, dentibus brevissimis (scilicet nec ultra 0·05 cm. longis) triangulari-acutis, trifidum; labium posticum oblongo-obovatum, ambo margine leviter crispulo-undulata; filamenta faucibus ipsis inserta, complanata, 3·0 cm. longa; discus brevissime bilobus, 0·4 cm. altus; ovarium ovoideo-oblongum, discum triplo excedens; stylus filiformis, staminibus subæquilongus; capsulæ non suppetebant.

Cum *B. Lyallii*, Nees, congruens potius quam cum *B. cuspidato*, Baker, cujus bracteæ amplissimæ et stamina subinclusa. Ceterum *B. Lyallii* habitu humiliore, foliis multo minoribus, bracteis angustis, floribus minoribus gaudet. Ob staturam elatam et folia ampla propius accedere videtur ad speciem nondescriptam Madagascariensem

(*Humblot*, n. 632) in Herb. Kew. asserv., bracteis vero diversis et floris partibus minoribus.

This is an interesting addition to a genus hitherto known only from Madagascar.

JUSTICIA (§ ROSTELLARIA) WHYTEI, S. Moore, sp. n. Herba foliosa, strigose pubescens, caule erecto, tetragono; foliis firmis, brevipetiolatis, lanceolatis vel lineari-lanceolatis obtusis, deorsum angustatis; floribus mediocribus axillaribus brevissime pedunculatis, bracteolis calyce multo brevioribus; calycis segmentis 5 subæqualibus, lanceolatis acuminatis, dorso carinulatis, pubescentibus; corollæ tubo calycem duplo excedente, recto, lato, faucibus dilatatis, labio postico bifido quam anticum amplum breviore; antherarum loculo inferiore superiorem ecalcaratum paullo excedente; disco integro; ovario anguste ovoideo-oblongo complanato, sursum in stylum inferne appresse pilosum desinente; loculis biovulatis; capsula oblongo-ovoidea, superne gradatim angustata, hirtulo-pubescente, tetrasperma.

Hab. Milanji. No. 136.

Caulis verisimiliter parce ramosus, vix usque 0·2 cm. diam. Folia 2·0–4·0 cm. longa, 0·5–1·2 cm. lata, margine revoluta, integra; costæ secundariæ 4–6, oblique insertæ, leviter arcuatæ; petioli 0·2–0·5 cm. longi; pedunculi circa 0·1 cm. longi; bracteæ foliaceæ, oblongæ obtusæ, 0·7 cm. longæ, 0·22 cm. latæ; bracteolæ 0·07 cm. longæ; calycis segmenta 0·25 cm. longa, 1-nervia; corollæ extus pubescentis verisimiliter dilute purpureæ tubo 0·45 cm. longo, ima basi 0·1 cm., sub faucibus vero 0·22 cm. lato; labium posticum oblongum, erectum, 0·3 cm. longum; labii antici, 0·4 cm. longi et vix totidem lati, lobus intermedius late ovatus, lobi laterales oblongi, ille 0·15 cm., hi equidem 0·1 cm. lati; palatus maxime eminens; filamenta planata, basi leviter puberula, vix 0·3 cm. longa; antherarum loculus inferior circa 0·07 cm. longus, ejus calcar angulo recto insertum; connectivus pilosus; discus 0·03 cm. altus; ovarium 0·15 cm. longum, stylo obtuso 0·5 cm. longo coronatum; capsula 0·55 cm. longa, 0·23 cm. lata; semina parva, oblongo-cylindracea, crebro tuberculata, pallida, 0·07 cm. longa, retinaculis debilibus oblongis obtusissimis, comparate latis, nervosis iisdem brevioribus suffulta.

Mihi videtur *J. neglectæ*, T. Anders., affinis, cujus attamen folia diversiformia, flores majores, calycis segmenta multo longiora, &c.

JUSTICIA ANSELLIANA, T. Anders. in Journ. Linn. Soc. vii. p. 44.

Hab. Milanji.

JUSTICIA (§ HORNIERA) MELAMPYRUM, S. Moore, sp. n. Erecta, foliosa, caule tetragono, minute necnon appresse puberulo; foliis membranaceis, lanceolatis vel ovato-lanceolatis, obtuse acutis vel acuminatis, basi cuneatis, petiolis brevibus fultis, fere omnino glabris vel secus nervos pag. inferioris appresse pubescentibus; floribus mediocribus axillaribus solitariis vel faucibus quavis ex axilla oriundis, brevissime pedunculatis; bracteis bracteolisque exiguis, calyce multo brevioribus; calycis segmentis

lanceolatis, longe subtiliter acuminatis, ciliolatis; corollæ tubo leviter curvato, calyci subæquilongo, sat lato, faucibus vero admodum coarctatis; limbi labio postico bifido quam anticum amplum breviter trilobum manifeste breviore; antherarum loculo superiore brevissime mucronulato, longiore ac angustiore; disco integro; ovario oblongo, sursum gradatim angustato; stylo obtuso, deorsum appresse piloso; loculis biovulatis; capsulis more sectionis dimorphis, aliis longioribus oblongis, sursum sensim coarctatis, aliis parvis oblongo-ovoideis, apice rostratis, tetraquetris, angulis cristulatis.

Hab. Milanji. No. 135.

Caulis 0·15–0·25 cm. diam., ejus anguli saltem in sicco eminentes; foliorum lamina 2·5–4·5 cm. longa, 0·8–2·3 cm. lata; costæ secundariæ 5–6, angulis angustis insertæ, fere rectæ; petioli 0·7 cm. longi; bracteæ et bracteolæ lineares, acutiusculæ, 0·13 cm. longæ; calycis segmenta 0·4 cm. longa, dorso obtuse carinata; corollæ extus minute pubescentis tubo ima basi 0·18 cm. lato, faucibus vero 0·28 cm. lato; labium posticum ovatum 0·33 cm. longum; labii antici, 0·4 cm. longi, lobi 0·1 cm. longi, lobus intermedius quam lobi laterales paullo latior; filamenta crassiuscula, 0·33 cm. longa; antherarum loculus superior 0·08 cm. longus, inferior duplo longior, hujus calcar curvatum et apice bifurcatum; discus 0·05 cm. altus; ovarium 0·15 cm. longum; stylus 0·5 cm. longus; capsulæ majores 0·6 cm. longæ, 0·2 cm. latæ, acutæ, verisimiliter 2–4-(an 2–3?)spermæ; minores 0·43 cm. longæ, media 0·2 cm. lata, 1-spermæ, omnes obsolete puberulæ; semina ambitu ovata, brunnescentia, crebro tuberculata, 0·1 cm. longa.

A *J. insulari*, T. And., secernenda ob folia angustiora brevius petiolata, bracteas longe dispares, calycis segmenta longiora, carinata, nec longe ciliata, flores aliquatenus majores et corollæ lobos majores præbentes, antherarum loculum inferius elongatum et calcare bifurco nec simplici auctum, ovarium longius et sursum angustatum, stigma obtusum nec leviter capitulatum, necnon capsulam breviorem.

Isoglossa milanjiensis, S. Moore, sp. n. Caule valido ascendente, geniculato, sursum folioso; foliis amplis, longipetiolatis, late obovato-oblongis, caudato-acuminatis, præter nervos pubescentes, obscure puberulis; floribus mediocribus in spicis brevibus terminalibus vel axillaribus dispositis; bracteis obovatis acutis vel breviter vel longius acuminatis, calyce brevioribus vel eum subæquantibus; bracteolis lanceolatis acutis, calyci subæquilongis; calycis segmentis inæqualibus (anticis longioribus), lineari-lanceolatis acutis vel acutiusculis, ciliolatis; corollæ tubo ample cylindraceo, calyce breviore; labii antici lobo medio obovato, lobis lateralibus oblongis breviore, labii postici elongati lobis brevibus, late oblongis; staminibus subexsertis; antheris discretis, distantibus, transversis; ovario ovoideo-oblongo, stylo crassiusculo, staminibus æquilongo; capsula haud visa.

Hab. Milanji, 6000 ft.

Caulis 0·4 cm. diam., ad nodos tumidos usque ad 0·8 cm. diam., obtuse angulatus,

appresse pubescens, deinde fere glaber; foliorum lamina ad 20·0 cm. longa et 7·5 cm. lata, tenuiter membranacea, in nervis appresse et minute pubescens; costæ laterales utroque latere 10–12, superiores distantius insertæ, levissime arcuatæ; petioli ad 6·5 cm. longi, complanati, demum glabri; spicæ nullæ ultra 5·0 cm. longæ, densifloræ; pedunculi suffulcientes ascendentes, 1·0 cm. longi, et una cum spicis pubescentes; bracteæ circa 0·5 cm. longæ, ciliolatæ; bracteolæ ciliatæ, 0·6 cm. longæ; calycis segmenta antica 0·7 cm. longa, segmenta reliqua paullo breviora et obtusiora, omnia puberula; alabastrum aperiens paullo ultra 1·0 cm. longum; corollæ tubus vix 0·5 cm. longus et latus; palatus convexus, venoso-rugosus; limbus circa 1·3 cm. diam.; labii antici lobus medius 0·45 cm. longus, lobi laterales 0·55 cm. longi, margine ad lobum medium spectante dente auctis vel ibidem expansis; labii postici, 1·0 cm. longi, lobi 0·33 cm. longi; lobi omnes obtusi; filamenta juxta basin tubi inserta, 0·7 cm. longa, puberula; connectivus 0·1 cm. longus; antheræ oblongæ, 0·15 cm. longæ, omnino ecalcaratæ; discus crenellatus, 0·05 cm. altus; ovarium 0·17 cm. longum, superne in stylum paullo incurvum 0·7 cm. longum desinens.

Species distincta, nulli affinis. *Isoglossa grandiflora* (*Ecteinanthus grandiflorus*, T. And.) folia minora brevipetiolata, calyces granduloso-tomentosos, flores multo majores ostendat, et *I. laxa*, Oliv., insuper folia parva, flores laxe paniculatos: forsan proxime accedat ad *I. origanoidem* (*Rhytiglossam origanoidem*, Nees), cujus habitus et folia sat similia, sed species Neesiana spicas densiusfloras, bracteas omnino dispares, et flores minores præbet.

Hypoëstes verticillaris, R. Br. Prod. p. 474.

Hab. Milanji, 6000 ft. No. 151.

Hypoëstes phaylopsoides, S. Moore, sp. n. Caule foliato tetragono pubescente, dein glabro; foliis ovato-lanceolatis acutis vel breviter acuminatis, margine repandis, supra appresse strigoso-hirtulis, subtus summum puberulis, petiolis sat longis insidentibus; capitulis terminalibus vel axillaribus ambitu ovatis vel subhemisphæricis, plurifloris; bracteis exterioribus foliaceis, amplis, late deltoideo-ovatis, interioribus oblanceolatis, omnibus obtusis, pubescenti-hirtulis; bracteolis parvis lanceolatis, calyce plus quam duplo brevioribus; calycis segmentis subæqualibus, anguste lineari-lanceolatis acuminatis, pubescenti-pilosis, hyalinis; corollæ calycem ½-superantis tubo superne ampliato, ibique pilosulo; labio postico brevissime bidentato, antico 3-lobo, lobo medio ovato, lobis lateralibus lanceolatis; staminibus quam labia brevioribus; disco lobulato; stylo exserto, apice breviter ac subæqualiter bifido; capsula calycem paullo excedente, oblongo-lineari acuta, ejus loculis 1–2-spermis.

Hab. Milanji. No. 126.

Caulis 2·0–3·0 cm. diam., longitrorsum striatulus; internodia circa 7·0–9·0 cm. longa, ramulorum vero juvenilium multo breviora; folia pleraque 4·0–7·0 cm. longa et 2·0–4·0 cm. lata, basi in petiolum angustata; costæ secundariæ utrovis latere 6–8, angulis latis insertæ, aperte arcuatæ; petioli tenues, 1·0–1·5 cm. longi, pubescentes;

capitula vix usque 2·0 cm. longa et 3·0 cm. diam., exstant vera minora; bracteæ exteriores circa 1·2 cm. longæ et latæ, interiores usque 1·3 cm. longæ, 0·3 cm. latæ, omnes basi dorso leviter carinulatæ; bracteolæ 0·3 cm. longæ, acutatæ, dorso pilosæ; calycis segmenta usque 0·7 cm. longa, 0·08 cm. lata, 1-nervia; corolla 1·0 cm. longa, ejus tubus 0·45 cm. longus, sub faucibus 0·23 cm. latus; limbi extus pubescentis labia subæqualia, inferius vero paullulum minus et 0·55 cm. longum (superius 0·6 cm. longum), hoc oblongum, illius lobi æquilongi et circa 0·1 cm. longi; filamenta complanata, 0·25 cm. longa; antheræ late oblongæ, obtussisimæ, vix 0·2 cm. longæ; discus 0·02 cm. altus; ovarium ovoideum, acutatum, transparens, 0·12 cm. longum; ovula loculis multo minora; capsula 1·2 cm. longa; ejus valvulæ a latere compressæ, puberulæ, subito acutatæ, pars asperma 0·5 cm. longa et dorso rugosa; semina purpureo-nigra, minute tuberculata, vix 0·2 cm. diam., retinaculis oblique truncatis, apice decoloribus, 0·2 cm. longis, suffulta.

Speciem nulli affiniorem, ob bracteas amplas, eas *Phaylopsidis* alicujus mentientes, primo obtutu cognoscere potes. Forsan juxta *H. diclipteroidem*, Nees, plantam Madagascariensem, intercalanda sit; nobis attamen videtur potius cum specie in Herb. Kew. nondum descripta a cl. Wood in Natal (no. 1058) et in Orange Free State a cl. Cooper (no. 3035) lecta componenda.

Selago Whyteana, Rolfe, sp. n. Fruticulosa, ramosissima; rami pubescentes; folia linearia, subacuta, asperula, 3–6 poll. longa; spicæ breves, terminales, numerosissimæ; bracteæ lineari-oblongæ, obtusæ, concavæ, læves, $\frac{3}{4}$ lin. longæ; calyx $\frac{1}{2}$ lin. longus, 5-fidus; lobi inæquales, lineari-oblongi, obtusi; corolla 1 lin. longa, 5-fida; tubus brevis; lobi oblongi, obtusi.

Hab. Milanji, 6500 ft. No. 28.

This species has much of the general habit and characters of *S. Dregei*, Rolfe (Journ. Linn. Soc. xx. p. 353), but the leaves are longer and more slender, and the flowers less than half the size of those of that species.

Selago milanjiensis, Rolfe, sp. n. Fruticulosa; rami puberuli; folia linearia, subobtusa, 5–9 lin. longa; spicæ breves, terminales, numerosæ; bracteæ lineari-oblongæ, obtusæ, concavæ, læves, $\frac{3}{4}$–1 lin. longæ; calyx $\frac{1}{2}$ lin. longus, 5-fidus; lobi inæquales, lineari-oblongi, obtusi, ciliati; corolla 1 lin. longa, 5-fida; tubus brevis; lobi rotundato-oblongi, obtusi.

Hab. Milanji.

Allied to the preceding, but a smaller, less robust plant, with much less pubescent branches, laxer inflorescence, and the calyx-lobes much less strongly ciliate.

Lantana salviæfolia, Jacq. Hort. Schoenb. iii. p. 18.

Hab. Milanji.

Vitex milanjiensis, Britten, sp. n. Arbor; ramis tetragonis, puberulis; foliis 5-foliolatis; foliolis oblongis truncatis mucronatis, basi cuneatis, margine integris, sinuatis, supra scaberulis, subtus pallidioribus, pubescentibus, nervo medio venisque primariis conspicuis; lateralibus breviter, centrali longiuscule petiolulatis; pedunculis axillaribus folio brevioribus, apice dichotome cymosis; bracteis subulatis; calyce hirsuto, 5-lobato, lobis deltoideis acutis; staminibus inclusis.

Hab. Milanji, 6000 ft., No. 138; Zomba.

In general appearance this much resembles *V. madiensis*, Oliver, of which it may possibly be a variety, especially in the inflorescence. It differs in the number and shape of the leaflets, which are quite entire, and is less hairy in all its parts.

Clerodendron discolor, Vatke, in Flora, xliii. p. 536.

Hab. Milanji, No. 124; Zomba.

Clerodendron myricoides, R. Br.

Hab. Milanji. Nos. 126, 193.

Plectranthus sanguineus, Britten, sp. n. Caule erecto, rugoso, inferne glabrato, superne farinoso, ramoso; foliis post anthesin evolutis (speciminibus immaturis); verticillastribus densis, multifloris; floribus subsessilibus, calyce exteriore villoso, campanulato, $1\frac{1}{2}$ lin. longo, dentibus acuminatis, setibus luteis articulatis; corolla 5 lin. longa; seminibus minutis, glabris.

Hab. Milanji, 6000 ft. No. 46.

A very distinct species, allied to *P. cylindraceus*, Hochst. Stems upright, 2 feet high, softly woody, giving off small lateral floral branches, and terminating in a panicle of 4–7 racemes 3–6 in. long; the central are longest. Verticillasters of the upper branches densely crowded together, although not so much so as in *P. cylindraceus*; those of the lower branches more distant. Calyx campanulate, with acuminate teeth, shaggy without, with yellow jointed hairs, and exuding, like the bud-scales, corollas, and stamens, bright red drops apparently of a resinous nature. Leafy shoots developing later from the lower buds of the main stem; leaves immature in specimens seen, tomentose, rugose, crenate, roundish or wedge-shaped, $\frac{1}{4}$–$\frac{1}{2}$ in. long, sessile or very shortly petiolate.

Plectranthus elegans, Britten, sp. n. Caule erecto; foliis petiolatis, ovatis, crenatis acutis, basi cuneatis; panicula racemosa, elongata, ramosa; cymis oppositis breviter pedunculatis, 2–3-floris; calyce dentibus inæqualibus, superiore obtuso ovato, cæteris acuminatis; corollæ labio superiore trilobo, lobo centrali truncato, lobis lateralibus rotundatis, labio inferiore concavo.

Hab. Milanji.

A perennial erect herb (upper portion alone seen); stem furrowed, hairy; leaves shortly petiolate ovate, 1–2 in. long, 1 in. or more broad, tapering to a wedge-shaped base, broadly and bluntly crenate, acute, scabrous and dark green above, softly hairy and paler beneath, with prominent veins; panicle narrowly triangular, leafless, racemose,

slender, 7 inches or more long; bracts small, entire, ovate acute; branches 3–4 in. long, ascending; cymes nearly sessile, 2–3-flowered, internodes ½ in. or more long; pedicels 2 lin. long; calyx minutely hairy, broadly campanulate, 1 lin. long; upper tooth ovate obtuse, lower teeth acuminate, the two lowest the longest; corolla 3–4 lin. long, upper lip 3-lobed, centre lobe truncate, 2 lateral lobes rounded, lower lip concave; stamens exserted.

PLECTRANTHUS MELLERI, Baker, in Journ. Bot. 1882, p. 243.
Hab. Milanji, 6000 ft. No. 102.

PLECTRANTHUS MANGANYENSIS, Baker, in Oliver, Fl. Trop. Afr. iv. ined.
Hab. Zomba.

PLECTRANTHUS GLANDULOSUS, Hook. fil. in Journ. Linn. Soc. vi. p. 17.
Hab. Zomba.

OCIMUM FILAMENTOSUM, Forsk. Fl. Ægypt. Arab. p. 108, var. ?
Hab. Milanji. No. 178.

OCIMUM HIANS, Benth. in DC. Prod. xii. p. 36? (O. CALYCOSUM, Hochst. in Schimp. Pl. Abyss. no. 2303).
Hab. Milanji.

ORTHOSIPHON COLORATUS, Vatke, in Linnæa, xliii. p. 86.
Hab. Zomba. No. 138.

ORTHOSIPHON KIRKII, Baker, in Fl. Trop. Afr. iv. ined.
Hab. Milanji. No. 101.

HOSLUNDIA DECUMBENS, Benth. in DC. Prod. xii. p. 54.
Hab. Milanji, 6000 ft., No. 156; Zomba.

HYPTIS PECTINATA, Poit. in Ann. Mus. Par. vii. (1806) p. 474, t. 30.
Hab. Zomba.

MICROMERIA BIFLORA, Benth. Lab. p. 378.
Hab. Milanji. No. 84.

SCUTELLARIA LIVINGSTONEI, Baker, in Fl. Trop. Afr. iv. ined.
Hab. Zomba.

STACHYS ÆTHIOPICA, Linn. Mant. p. 82.
Hab. Milanji. Nos. 20, 128.

A wide-spread South-African species, not hitherto, I believe, recorded from the Tropics.

LEUCAS GLABRATA, R. Br. Prod. p. 504.
Hab. Milanji. Nos. 127, 128, 191.

APETALÆ.

PIPERACEÆ and EUPHORBIACEÆ. (By E. G. BAKER, F.L.S.)

AMARANTACEÆ, POLYGONACEÆ, PROTEACEÆ, THYMELEACEÆ, SANTALACEÆ, and MYRICACEÆ. (By A. B. RENDLE, M.A., F.L.S.)

PEPEROMIA REFLEXA, Dietr.; DC. Prod. xvi. 1, p. 451.
Hab. Milanji.
Widely spread in the Tropics.

PHYLLANTHUS ROTUNDIFOLIUS, Willd.; Müll. Arg. in DC. Prod. xv. 2, p. 405.
Hab. Milanji.
Widely spread in the Tropics of the Old World.

PHYLLANTHUS ROTUNDIFOLIUS, var. LEUCOCALYX, Müll. Arg. l. c. p. 406.
Hab. Milanji, alt. 6000 ft. No. 23.
Distr. Abyssinia; Zambesi-land; Angola.

PHYLLANTHUS, sp.
Hab. Milanji, alt. 7000 ft. No. 29.
There are no flowers on this specimen.

ANTIDESMA, sp.
Hab. Milanji. No. 170.

ACALYPHA VILLICAULIS, A. Rich. Tent. Fl. Abyss. ii. p. 248; Müll. Arg. l. c. p. 845.
Hab. Zomba; Milanji, alt. 6000 ft. No. 120.
Distr. Abyssinia, Central Africa, Manganya Hills.

ACALYPHA BENGUELENSIS, Müll. Arg. in Journ. Bot. 1864, p. 335.
Hab. Zomba; Milanji, alt. 6000 ft. No. 65.
Previously collected only by Welwitsch in Benguela.

EUPHORBIA SHIRENSIS, Baker fil., n. sp. Radix lignosa; caulibus herbaceis, erectis, striatis, glabris, simplicibus vel parce ramosis, sparse foliosis, rarissime subdense foliosis; foliis integris, obovatis vel anguste ovatis, vel oblongis alternatis subcoriaceis penninervatis, utrinque glabris, petiolatis, petiolis brevissimis, foliis ramorum lateralium angustioribus; foliis floralibus liberis ovatis vel rotundatis, latioribus quam longis, glandulis semilunatis; filamentis glabris, stylis erectis, stigmatibus bifurcatis; capsulis pedunculatis, elevato-rugosis, trisulcatis; seminibus rubro-fulvis lævibus.
Hab. Milanji.

Stems 9–15 in. high; leaves $\frac{3}{4}$–$1\frac{1}{2}$ or even 2 in. long; flowering leaves $\frac{5}{8}$ in. long.

This plant belongs to the section *Tithymalus*, and is near *E. dilatata*, Hochst.

Euphorbia Whyteana, Baker fil., n. sp. Fruticosa, ramis elongatis, virgatis, subdense foliosis, tenuiter striatis; umbellæ radiis 3–9 brevibus pluries bifidis; foliis subcoriaceis, integris, anguste oblanceolatis, superne glabris vel glabriusculis, subtus parce glaucescentibus, penninervatis, margine subrevoluto, apice in mucronem abruptiuscule brevissime attenuatis; foliis floralibus liberis, triangulari-acutis; involucri turbinati glandulis crescentiformibus breviter cornutis; stylis bifurcatis; capsulis pedunculatis, glabris tenuiter rugulosis; pedunculis pubescentibus; seminibus non visis.

Hab. Milanji plateau, alt. 6000 ft. No. 24.

Cauline leaves about 1 in. long.

This plant belongs to the section *Tithymalus*, and is allied to *E. involucrata*, E. Mey.; the bracts, however, are much narrower than in this species, and the cauline leaves are nearly twice as long and rarely deflexed.

Celosia trigyna, Linn.

Hab. Milanji, 2000 ft., Oct. No. 166.

Distr. Throughout Tropical Africa; also Arabia and Natal.

Polygonum serrulatum, Lag. Gen. et Sp. Plant. 14, no. 181.

Hab. Zomba, Sept.

Distr. Throughout the Mediterranean region; Syria to North India; North, Tropical, and South Africa, Canary Is., and Madeira.

Protea nyasæ, Rendle, sp. n. Caulescens; foliis oblongis, apice rotundatis emarginatis, basi attenuatis, sessilibus, unicostatis, glabris, coriaceis; capitulo terminali, magno, turbinato, squamis multiseriatis, arcte imbricatis, lævibus, inferioribus minoribus late ovatis, margine ciliolatis, superioribus majoribus oblongis, deinde spathulato-oblongis, margine glabris; perianthio glabrato vel sparsissime pubescente.

Shoot strong and woody. Leaves (of last season) oblong, with rounded emarginate apex, narrowed at the base, sessile, one-nerved, glabrous, coriaceous; 2–$2\frac{3}{4}$ in. long, 6–7 lines broad. Capitulum terminal on shoot of present season, from which all the leaves have dropped, turbinate, $3\frac{1}{2}$ in. broad at the top, $2\frac{3}{4}$ in. long; bracts of involucre many-seriate, closely imbricate, smooth, the lower and smaller broadly ovate, with a ciliolate margin, the size increasing upwards, and the shape varying through ovate to the uppermost, which are spathulate-oblong; except in the lower the margin is glabrous. Perianth $1\frac{3}{4}$ in. long, glabrous or very sparsely pubescent; the lower broad portion of the tube 5 lines long by 1 line in diameter, the slender portion $\frac{3}{4}$ in. by $\frac{1}{2}$ line, the limb 7 lines long, segments $\frac{1}{3}$ line broad, linear with a subulate apex produced $1\frac{1}{2}$ lines beyond the linear anther, which is $4\frac{1}{2}$ lines long. Style subulate, $1\frac{3}{4}$ lines long, channelled above. There is a hypogynous tuft of ferruginous hairs 5 lines long.

Hab. Milanji. No. 30.

Nearly allied to *Protea madiensis*, Oliver (Trans. Linn. Soc. ser. I. xxix. p. 143), the glabrous capitulum being about the same size in each and having a similar arrangement of bracts; but the leaves differ very markedly, those of *P. madiensis* being larger, oval, and more pointed, 7 in. long by $2\frac{1}{2}$–$2\frac{3}{4}$ broad, while the perianth-tube is densely villose. They are both allied to *P. abyssinica*, Hochst., which, however, is at once distinguished by the white sericeous bracts, hairy perianth, and differently shaped leaves.

Arthrosolen flavus, Rendle, sp. n. Frutex ramis sesquipedalibus, teretibus, striatis, glabratis, viridibus; foliis sparsis, adscendentibus, inferioribus lineari-lanceolatis, basi longe attenuatis, superioribus lineari-subulatis, uninerviis, glabris, rugulosis; involucris squamis, multiseriatis, imbricatis, quam flores minoribus, glabris, exterioribus lanceolatis acuminatis, interioribus ovatis acutis vel subacuminatis; capitulo semigloboso, multifloro; perianthio flavo, tubo gracili minute pubescente, limbi lobis patentibus obovatis.

Flowering branches of the present year only, $1\frac{1}{2}$ ft. long, terete, striate, glabrous, green. Leaves scattered, ascending, linear-lanceolate, below with a long attenuate base, becoming linear-subulate above, apex subacute, one-nerved, glabrous, rugulose, 8–10 lines long, $\frac{1}{2}$–1 line broad. Involucral bracts multiseriate, imbricate, outer lanceolate, acuminate, inner ovate, acute or subacuminate, shorter than the flowers, glabrous, green, except the innermost, which are yellowish. Capitula hemispherical, many-flowered, $\frac{3}{4}$ in. long by $\frac{1}{2}$ in. broad. Pedicels $\frac{1}{2}$–$\frac{3}{4}$ line long; a tuft, 1 line long, of stiff colourless persistent hairs surrounds the base of the perianth. Perianth yellow; tube minutely pubescent, $4\frac{1}{2}$ lines long, $\frac{1}{3}$ line in diameter; limb spreading; lobes obovate, apiculate, minutely pubescent below, minutely papillose above, 2 lines long, more than 1 line broad at the base. No scales on the perianth. Stamens sessile, in two whorls of four; anthers of upper row linear-oblong, acute, slightly exserted, $\frac{2}{3}$ line long, of lower row oblong, with a rounder apex. Style short, filiform, about 1 line long. Stigma capitate, hairy.

Hab. Milanji, 6000 ft. (*A. Whyte*, no. 99; Herb. Mus. Brit.); Blantyre (*L. Scott*; Herb. Kew).

Near *A. glaucescens*, Oliver (Journ. Linn. Soc. xv. p. 96), but the latter is a very glaucous plant, smaller, and has red flowers; the perianth-limb, moreover, is lanceolate, $1\frac{1}{2}$ lines long, and less than $\frac{1}{2}$ line at the broadest part, while that of *A. flavus* is obovate, 2 lines long, and more than 1 line broad.

Gnidia microcephala, Meisn. in DC. Prodr. xiv. p. 589.

Hab. Milanji and Zomba, Sept. and Oct. 1891 (*A. Whyte*); Zomba and east end of Lake Shirwa, Oct. 1861, Livingstone's Zambesi Expedition (*C. T. Meller*; Herb. Kew); Namuli, Makua Country (*J. T. Last*; Herb. Kew); Biggarsberg, 4000 ft. (*J. M. Wood*; Natal Govt. Herb. no. 846); Macalisberg, Transvaal (*Burke*, no. 96); Kitui in Ukamba (*Hildebrandt*, no. 2807).

There is a very similar plant in Herb. Kew, collected on the Niger, W. Trop. Africa, by Dr. Baikie.

GNIDIA FASTIGIATA, Rendle, sp. n. Suffrutex, subpedalis, ramis subfastigiatis, pubescentibus; foliis densis, suberectis, rigidis, lanceolatis, acutis, uninerviis, glabris, supra rugulosis; floribus solitariis, binis, aut forte ternis, in ramulis brevibus axillaribus sub vertice ramorum; bracteis pubescentibus; perianthio dense ciliato-pubescente, tubo bilineo cum pilorum fasciculo pone antheras superas, lobis subpatentibus ovatis, squamis binis ligulatis, glabris, basi fultis; andrœcio tetramero obdiplostamineo; ovario ovato; stylo laterali filiformi; stigmate capitato, sæpius antheras inferiores, rarius superiores attinente, vel rare stylo brevissimo.

A small shrub, up to 10 in. high, with ascending subfastigiate branches, closely covered by the narrow, acute leaves. Leaves 5–6 lines long by $\frac{1}{2}$–1 line broad, the lower being the broader. Flowers on short, small-leaved axillary shoots, in the upper one or two inches of the branches; the lowest shoots very reduced, with one terminal flower, the greater number more developed, with two flowers or the rudiment of a third, which in the larger ones may be fully developed; at the top of the branch again one-flowered. The small leaves of the shoots and the slightly larger bract are similar in form to the ordinary foliage-leaves, but are pubescent like the perianth. Perianth-tube 2 lines long, $\frac{1}{3}$ line broad, the slightly spreading limbs $\frac{3}{4}$ line long, each with a pair of ligulate scales one each side of the base. Surrounding the base of the tube is a calycine circlet of stiffish hairs about $\frac{1}{2}$ line long. A tuft of hairs behind the anthers of the upper row alternates with the scales. The lower persistent portion of the perianth-tube is of a darker colour and longitudinally ribbed; the ovary in the flower reaches about halfway up this lower portion. The filiform style is attached a little below the apex, and varies in length in different flowers.

Hab. Milanji, 6000–8000 ft., Oct. A very distinct species.

THESIUM NIGRICANS, Rendle, sp. n. Suffrutex, ramis et ramulis tenuibus, subrigidis, patentibus; foliis sessilibus, linearibus, mucronatis, plano-convexis, glabris, margine scabridulis; floribus parvis, apice ramulorum axillaribus, breviter pedicellatis; bracteis cum duabus bracteolis foliis consimilibus, bracteolis autem minoribus et florem fructumve subæquantibus; perianthio campanuliformi, tubo brevi, lobis 4–5 subpatentibus, glabris, apice inflexis papillosis, cum pilis paucis erectis pone antherarum filamenta brevia; stigmate capitato, stamina superante; nuce ovoidea, rugis 8–10 notata, cum reticulis paucis obliquis, quam perianthium latiore.

A much-branched shrubby or suffrutescent plant, which turns black in drying. The linear leaves flattened above, rounded beneath, from $\frac{1}{3}$–$\frac{3}{4}$ in. long, about $\frac{1}{2}$ line wide, with the insertion continued as a ridge down the stem to the next leaf vertically below. There are four to five small flowers (1 line long) at the top of the branches, each in the axil of a leaf-like bract, with two shorter similar bracteoles near the base of the pedicel, at right angles to the plane of insertion of the bract, which is decurrrent to the next

lower node; the base of the pedicel is adnate to the bract, and the bracteoles are inserted at the point where the two separate. The perianth-lobes are triangular-ovate, a little over $\frac{1}{3}$ line long, and slightly involuted at the tip, more so in the fruit. The 4 or 5 stamens have very short filaments, behind which is a tuft of a few rather long upwardly-directed hairs. The ovoid nut is 8–10-ribbed, with a few oblique connecting reticulations, is 1 line long by $\frac{2}{3}$ line in diameter, and broader than the persistent perianth.

Hab. Milanji, 6000 ft., Oct. (no. 42); Zomba, Sept.

Belongs to the section *Euthesium*, and is near *Thesium Wightianum*, Wall., an East Indian species, from which it is easily distinguished by its subrigid habit, longer linear leaves, and smaller fruit. The flower of *Th. Wightianum* is half as large again, and the perianth-lobes are markedly spreading and papillose-pilose.

THESIUM (§ FRISEA) WHYTEANUM, Rendle, sp. n. (Plate IX. figs. 1–5.) Suffrutex, glaber, ramis tenuibus suberectis, pedalibus, infra nudis, supra foliosis, sub vertice ramulosis, ramulis foliosis vel floriferis; foliis sessilibus, ramorum uncialibus, linearibus, crassiusculis, subteretibus, pungentibus, ramulorum brevioribus, plano-convexis; floribus solitariis, axillaribus, vel singulis binisve in ramulis parvis; bracteis et bracteolis foliis consimilibus, his autem minoribus, flore et fructu duplo brevioribus; perianthii lobis quinque, apice involutis, cucullatis, et longe pilosis; antheris glabris, pendentibus; stylo brevissimo, stigmate papilloso; nuce subgloboso, decemcostato, oblique reticulato.

A glabrous shrub with branches a foot long, leafless below, leafy above, branching near the top; leaves of the primary branches subterete, longitudinally channelled, an inch or more long, of the secondary shorter, linear-subulate, flattened above, rounded beneath. Inflorescence apparently a long leafy spike; the few uppermost flowers solitary in the axils of the leaves, those next below terminating short axillary shoots, the lowest in pairs, terminal and lateral on the shoots; the bract and pair of bracteoles resembling the smaller leaves, the former about equal to the length of the flower, the latter about half. Flowers about $1\frac{1}{2}$ lines long. Perianth cup and lobe nearly 1 line, the five lobes involute and hooded at the apex with a tuft of hairs, hairs continued about halfway down the margins; the five glabrous anthers opposite the perianth-lobes fixed by a short filament and hanging down into the cavity; a tuft of hairs springs from the perianth behind the filament and ascending is attached to the top of the anther. Style very short, with a papillose, scarcely swollen stigma, on a level with the base of the anthers. Fruit almost sessile, ovoid-globose or nearly globular, a little more than a line long and nearly as broad, crowned by the much narrower subcylindrical perianth, with ten ribs, the alternate ones less pronounced, connected by irregular reticulations.

Hab. Milanji, 6000 ft., Oct. No. 45.

The discovery of this species extends the distribution of the well-marked section *Frisea* from South to Tropical Africa.

Myrica pilulifera, Rendle, sp. n. Arborescens; foliis breviter petiolatis, ellipticis, acutis, serratis integrisve, uninerviis, supra lævibus, infra minute farinosis; fructibus globosis in spicis axillaribus, sesquilineis; pericarpio papilloso; endocarpio duro.

Shoots of previous years woody, strongly marked with ridges decurrent from the prominent leaf-scar, and with conspicuous lenticels; that of the present year farinose. Leaves shortly petiolate, elliptic, acute, serrate, one-nerved, glabrous and smooth above except for a few scattered hairs on the midrib, minutely farinose beneath; the lower leaves of a shoot are much smaller, with an entire margin; the larger leaves are from 2–2½ in. long, by 8–10 lines broad. Fruit on numerous spikes seated in the axils of the insertion of last year's leaves, all of which have fallen, globular, 1½ lines in diameter; pericarp of papillæ with a waxy excretion; endocarp hard, globular.

Near *Myrica salicifolia*, Hochst., but differs in the regular shape and serration of the normal leaves, the smaller fruit, and the spherical endocarp, that of *M. salicifolia* being subovate or pyriform. The lenticels are also very large and characteristic.

Hab. Milanji, Oct.

Fruiting specimens only.

MONOCOTYLEDONS. (By A. B. Rendle, M.A., F.L.S.)

Cyperaceæ. (By C. Baron Clarke, M.A., F.R.S.)

Eulophia longisepala, Rendle, sp. n. Herba caule tenui, sesquipedali, laxe paucifloro; bracteis brunneis, brevibus, ovatis, acutis, pedicello perbrevi multo longioribus; sepalis longis, fere uncialibus, clavatis, apiculatis, petala longe excedentibus; petalis cuneato-spathulatis, apiculatis; labello trilobo; lobis lateralibus majoribus ad columnam ascendentibus, rotundatis, integris, venis prominentibus; lobo terminali oblato, emarginato, margine crispo, verrucis lamelliformibus in venis mediis suffulto; calcare robusto, brevi, recurvato; columna clavata, erecta, supra alata.

The slender peduncle, 1½ ft. long, bears a few almost sessile flowers arranged laxly in the axils of short bracts 2 lines long. The narrow clavate sepals are 11 lines long, nearly twice the length of the broader more spathulate petals, which are 6 lines long by 1⅔ lines broad. The lateral lobes of the lip are 5 lines long, with thickened projecting lateral veins; the shortened terminal lobe is 2½ lines long by 5 broad, bearing a double row of projecting lamelliform calli on the central veins. The short recurved spur is about ⅓ in. long. The erect column, broadly winged above, is 3 lines long, ½ line broad at the base, 1 line above.

Near *E. Petersii*, Reichb. f., but at once distinguished by its slender clavate sepals much exceeding the petals; *E. Petersii* has also a broader, more ligulate petal, and a much narrower lip. Apparently, from the description, allied to *E. Meleagris*, Reichb. f., which has very unequal sepals and petals, but a many-(17–18-)flowered raceme, much shorter oblong-lanceolate sepals, shorter, ovate-acute, irregularly denticulate petals, and a differently shaped lip.

Hab. Milanji, Sept.

EULOPHIA MILANJIANA, Rendle, sp. n. Caule valido, striato, foliis longis, lanceolatis, basi circumdato; bracteis sterilibus membranaceis, pallide brunneis, margine longe connatis, internodia infera omnino, supera autem partim, vaginantibus; racemo dense corymboso, bipollicari, bracteis florentibus longis subulatis, pallide brunneis, venis fuscis striatis, ovarium pedicellatum excedentibus; sepalis petalis consimilibus, sed majoribus, ovatis acutis, apice subfalcatis; labello trilobo, lobo medio quam lobi laterales, oblongi, ascendentes, integri, glabri, plus triplo majore, obovato-orbiculari; disco tomentoso, basi verrucis geminis suffulto; calcare brevi obtuso; columna brevi crassa, alis tenuibus.

The peduncle springs from among long, lanceolate, longitudinally-ribbed radical leaves, with a long, narrow, sheathing base, immature in the specimen, but apparently resembling those of *Eulophia* (§ *Orthochilus*) *abyssinica*, Reichb. f. Only the upper part of the mature peduncles was present, 1 foot long by $\frac{1}{4}$ in. diameter below, and striate, with long, acute, sheathing bracts, which are membranous, pale brown, with fine veins, and their edges connate for more than half their length, slightly spreading at the tip, the two lower 3–$3\frac{1}{2}$ in. long, the uppermost $2\frac{1}{4}$–$2\frac{1}{2}$ in. The inflorescence forms a dense corymb, 2 in. high by 2 in. broad near the base. The flowering bracts are subulate, pale brown, marked with numerous darker veins, and exceed the stalked ovary; the lowermost 14 lines long, the size decreasing upwards. The outer flowers are the larger. The sepals are 10–13 lines long by 4–6 broad; the petals are smaller, 8 by 3 lines, but otherwise similar. The small oblong lateral lobes of the lip, 3 lines long by 2 broad, are entire and glabrous; the central, almost suborbicular, lobe measures 6 by $5\frac{1}{2}$ lines, has a long-haired tomentum on the disk, with two knob-like warts on the veins just at its union with the lateral lobes. The short thick column is 2 lines long by 1 wide, and has thin wings; the short blunt spur is 2 lines long.

Hab. Lower Milanji, 2,500 ft., Oct. 1891 (*A. Whyte*, no. 257); Manganja Hills (Livingstone's Zambesi Exped. 1861; Herb. Kew.); Livingstone's S. African Exped. (Herb. Kew.); Uganda, 1880 (*Rev. C. T. Wilson*, no. 114; Herb. Kew.); Nyasa-land, 1891 (*Buchanan*, nos. 349 & 1328; Herb. Kew.).

Near *E. bicolor*, Reichb. f., but differs in its slightly smaller flowers and corymbose inflorescence, that of *E. bicolor* being a somewhat crowded raceme, twice the length; also in the lip, which is more delicate and devoid of the purple colour on the lateral lobes which characterizes those of *E. bicolor*, where moreover the long-haired tomentum is absent, scattered tufts of short filiform calli taking its place.

It is also near *E.* (§ *Orthochilus*) *abyssinica*, Reichb. f., but distinguished by the shape of the lip as well as by its larger flower and more crowded inflorescence.

EULOPHIA NYASÆ, Rendle, sp. n. Herba pedunculo sesquipedali, basi folio vaginante circumdato, infra tereti, supra sulcato, bractea triangulari-ovata acuta, supra basin breviter connatam libera, pedunculum autem arcte amplectante; racemo laxo secundo 9-pollicari, bracteis subulatis, patentibus, uninerviis, pedicella brevia paullo exceden-

tibus; sepala quam petala longioribus, oblongo-ligulatis, subacutis, petalis ovalibus, obtusis; labello semipollicari, parte inferiore et majore trapezoideo, superiore triangulari-ovato obtuso, dense tomentoso; calcare brevi obtuso; columna crassiuscula.

Peduncle 19–21 in. long, clothed at the base with a sheathing-leaf $2\frac{1}{2}$ in. long, which also includes two young foliage-leaves; $1\frac{1}{2}$ line in thickness an inch above the base, terete below, becoming longitudinally grooved above when dry, bearing one bract at about a third the way up. Bract $\frac{3}{4}$ in. long, margins connate for 1 line at the base, then rapidly receding to form the upper free triangular part, which, however, is closely applied to the peduncle. The lax secund raceme is about 9 in. long; the lower bracts are 5 lines long, the size decreasing upwards. The short pedicels are about 2 lines long. The oblong ligulate sepals are longer and much darker than the petals, 3-nerved, 8 lines long, $1\frac{1}{2}$ broad, but narrower at the base; petals $5\frac{1}{2}$ by 2 lines, with a prominent midrib and two upwardly branching lateral veins. The lower part of the lip, when flattened, is trapezoid (the sides naturally ascend), 4 lines long by $2\frac{1}{2}$ wide in the lower half, then slightly widening upwards to 3 lines at the two rounded angles; the apical lobe is 2 lines long by $1\frac{3}{4}$ broad at the base, and has its upper surface covered, except near the margin, with a matted tomentum arising from the veins and passing down the three median nerves a short way into the lower part. The spur is blunt, swollen and rounded at the tip, $2\frac{1}{4}$ lines long. The column is $2\frac{3}{4}$ lines long, 1 broad.

Hab. Milanji, Sept.

The structure of the flower recalls that of a group of Cape species including *Eulophia lamellata*, Lindl., which it somewhat resembles, but is distinguished by the marked difference in size between the sepals and petals, and the shape of the apical lobe of the lip, which in *E. lamellata* is much larger, quadrate, and has a longer tomentum; the inflorescence in that species is branched and the bracts are longer.

LISSOCHILUS ARENARIUS, Lindl. in Journ. Linn. Soc. vi. p. 133.

Lindley described this species from a West Tropical African plant (*Barter*, no. 1488), but it seems common in the East.

Hab. Im Lande der Djur (*Schweinfurth*, Reise nach Central Africa, no. 1864); Nyika Country (*Rev. E. T. Wakefield*; Herb. Kew.); Lake Tanjanika (*Lieut. Cameron*; Herb. Kew.); Rabai Hills, Mombaz, March 1886 (*Rev. W. E. Taylor*; Herb. Mus. Brit.); Milanji, Nyasa-land, Oct. 1891 (*A. Whyte*).

Reichenbach (Otia Bot. Hamb. p. 75) makes Hildebrandt's plant, no. 1950, Mombassa, 1876, the same species; it differs slightly from the other East Tropical specimens seen in its acuminate lateral sepals, and in having small warts on the surface of the labellum in front of the pairs of calli. The lamelliform calli vary in the different specimens in shape, in the character of the apex, which may be crenate or emarginate, and in their more or less erect position on the veins.

LISSOCHILUS LIVINGSTONIANUS, Reichb. f. Otia Bot. Hamb. p. 114.

Hab. Manganja Hills, Livingstone's Zambesi Exped. (*C. Meller*; Herb. Kew.); Man-

ganja Hills, E. Africa (*H. Waller*; Herb. Kew.); Nyika Country, E. Trop. Africa (*Rev. E. T. Wakefield*; Herb. Kew.); Milanji, Nyasa-land, Oct. 1891 (*A. Whyte*).

An East Tropical African species.

Lissochilus Wakefieldi, Reichb. f. & S. Moore, in Journ. Bot. 1878, p. 136.

Hab. Mombassa, *Hildebrandt*; Rabai Hills, Mombaz (*Rev. W. E. Taylor*; Herb. Mus. Brit.); Milanji, 1891 (*A. Whyte*).

Lissochilus milanjianus, Rendle, sp. n. Pedunculo elongato, racemoso, laxifloro; bracteis membranaceis, brunneis, triangulis, longe acuminatis, ovaria pedicellata haud æquantibus; sepalis lateralibus ad basin labelli adnatis, oblongis, apiculatis, basi truncatis; dorsali oblongo angustiore; petalis orbicularibus, minute apiculatis, multinerviis; labelli lobis lateralibus brevibus, truncatis, latera sacci cum calcare continui formantibus, lobo medio basi profunde tricarinato, apice integro obtuso; calcare tenui brevi; columna brevi crassa.

There were no leaves with the specimen. The raceme is laxly 8-flowered on the upper part of the leafless peduncle, which is 12–20 inches long. Sepals much smaller than the petals, the lateral 4 lines long by $2\frac{1}{2}$ lines wide, the dorsal narrower ($1\frac{1}{2}$ line wide), the petals 7 lines long and broad. The lateral lobes of the labellum form the sides of a deep sac, of which the spur is a slender pointed continuation 2 lines long; the median lobe is $4\frac{1}{2}$ lines long, the lower part convex and deeply tricarinate on the crest, with raised lateral veins below; the apical lobe is more flattened and spreading. The short thick column is 2 lines long.

Hab. Milanji.

There is in Herb. Kew. a specimen (Livingstone's Zambesi Expedition, Manganja Hills), with somewhat larger flowers, slightly narrower longer sepals, a blunt thicker spur, and apparently of a lighter colour, but the characters of the lip are the same, and I doubt whether it can be separated from the Milanji plant.

Brachycorythis pleistophylla, Reichb. f. Otia Bot. Hamb. p. 104.

Hab. Livingstone's S. Afr. Exped., Moramballa, Dec. 1838 (*C. Meller*; Herb. Kew.); Nyasa-land, 1891 (*Buchanan*, no. 1345; Herb. Kew.); Milanji, Oct. 1891 (*A. Whyte*).

The flowers of the Milanji specimen are larger than those of the type, and the bracts, differ in being prolonged into a subulate aristate apex half as long as the leaf. In Buchanan's specimen also the bracts have this character, while the flowers are intermediate in size.

Polystachya, sp. n.

Hab. Milanji, Oct.

Material insufficient for description.

In Herb. Kew. there is a specimen with ripe fruit, evidently of the same species, collected by Sir J. Kirk at Zomba, Zambesia, 6000–7000 ft., in Sept. 1859; that is, in the same district and at about the same altitude as the Milanji plant.

The plants turn black on drying; the slightly ribbed leaf-sheaths decrease in length from 14 lines at the base of the stem to 10 lines just below the simple spike. Leaf-blade linear-oblong, with a rounded apex and fine prominent longitudinal veins $2\frac{3}{4}$ to $3\frac{3}{4}$ in. long, 6–7 lines wide. The acuminate bracts are about 3 lines long, the spike $2\frac{3}{4}$ in. The flowers, now dropped, have been few and distant.

Disa zombaensis, Rendle, sp. n. (Plate VII. A, figs. 1–3.) Insignis caule robusto, rufescente, infra foliato, foliis quinque spiraliter ordinatis, rufescentibus, late lanceolatis, subacuminatis, sessilibus, supra in spicam densam evoluto; bracteis lanceolatis, foliis consimilibus, sed minoribus, infra flores sessiles excedentibus, supra iis subæqualibus aut apice brevioribus; sepalis lateralibus ovali-oblongis, apice oblique apiculatis, venis tribus conspicuis convergentibus, sepalo dorsali majore galeato in calcar longum, tenue, subrecurvatum, semipollicare producto; petalis ligulatis, galea inclusis, semipollicaribus; labello tenui, filiformi; columna crassa, brevi, truncata; ovario hirto, subcylindrico, utrinque attenuato.

The stem is 2 ft. 4 in. long; the lower 7 in. are leafy, with broadly lanceolate leaves, decreasing in size upwards from $3\frac{1}{2}$ to 3 in. long by $1-\frac{3}{4}$ in. broad; the remainder forms a dense spike of sessile flowers, subtended by lanceolate bracts smaller than, but otherwise similar to, the leaves, and also decreasing upwards, the lower ones exceeding the flowers, the uppermost falling short of them. The oval-oblong sepals are 6–7 lines long by $3-3\frac{1}{2}$ wide, with three fine but well-marked darker longitudinal veins converging at the apex, and several fainter ones between these and the margin; the large hooded posterior sepal is $\frac{3}{4}$ in. high by $\frac{1}{2}$ in. broad, and produced into a narrow, slightly recurved dorsal spur, $\frac{1}{2}$ in. long. The ligulate petals are 6 lines long by 1 broad, 5-nerved below, 3-nerved above. The filiform lip is 5 lines long by $\frac{1}{4}$ line wide. The ovary is $\frac{3}{4}$ in. long and $2\frac{1}{2}$ lines thick, subcylindrical, narrowing at either end.

Hab. Zomba, Dec. 1891. No. 3.

Resembles *Disa Walleri*, but the flowers are twice the size.

Disa (§ Herschelia) hamatopetala, Rendle, sp. n. (Plate VII. B, figs. 4–6.) Erecta, glabra, foliis radicalibus anguste gramineis; scapo flexuoso, laxe 2–7-floro, bracteis brunneis, membranaceis, ovatis acuminatis, sterilibus, margine sub medio connatis; floribus breviter pedicellatis; sepalis lateralibus ovali-oblongis, obtusis, dorsali galeato, calcare brevi recto-cylindrico; petalis basi columnæ adnatis, hamatis, apice late emarginatis; labello elongato, triangulari, plano, supra basin profunde fimbriato.

The flexuose stem is densely surrounded at the base by the remains of the withered grass-like leaves, and varies in length from 6 or 7 inches to more than a foot, the shorter forms bearing only one or two flowers, which are also smaller than those on the larger, more robust stems. The bracts on the lower part of the flower-stem have their edges connate for half their length or more; in the region of the flowers they are free. The larger flowers measure $1\frac{1}{4}$ in. from the top of the spur to the end of the lateral sepals; some of

the smaller ones are less than 1 in. (11 lines). In the larger the lateral sepals are $\frac{3}{4}$ in. long by $\frac{1}{3}$ in. broad, the hooded dorsal one $\frac{3}{4}$ in. high by nearly $\frac{1}{2}$ in. from front to back; the spur is 2 lines long by $1\frac{1}{2}$ in diameter. The hooked petals are nearly $\frac{1}{2}$ in. long, laterally attached by the broader base to the side of the column, widening again near the broadly emarginate apex. Lip $\frac{3}{4}$ in. long, tapering upwards, the sides, except near the base, deeply fimbriate as well as the apex.

Hab. Milanji, 6000 ft., Oct. 1891 (*A. Whyte*, nos. 36, 136, & 199); Nyasa-land, 1891 (*Buchanan*, no. 1016); Higher Plateau, North of L. Nyasa, Oct. 1880 (*Thomson*); Zomba, Zambesia, 6000–7000 ft., Sept. 1859 (*Kirk*); between L. Tanganyika and Nyasa, April 1890 (*H. H. Johnston*). All in Herb. Kew.

Belongs to the section *Herschelia*, and is near *Disa lacera*, Sw., var. *multifida*, N. E. Brown, figured in the Bot. Mag. 7066, but is distinguished by the blunt sepals, the characteristic shape of the petals, and the blunter spur in a straight line with the base of the hooded sepal. The lip, moreover, is much more deeply fimbriated.

ARISTEA JOHNSTONIANA, Rendle, sp. n. Herba foliis radicalibus subpedalibus, rigidis, linearibus, superne attenuatis, acutis; pedunculis pedalibus, complanatis, aphyllis, vix alatis; bractea vaginante acuminata, nunc inflorescentiam paucifloram superante, nunc breviore; spathæ valva exteriore triangulari acuta, interiore brunnea, membranacea, haud lacerata; perianthii segmentis obovatis, patentibus.

The leaves, which are condensed into a radical rosette, are nearly a foot long and 1–2 lines broad. The very narrowly winged leafless peduncle ends in a small, usually 3-flowered stalked head above a green sheathing acuminate bract, which sometimes overtops the head, sometimes falls short of its stalk; there is usually a smaller lateral cluster sessile in the axil of the bract and included by it. The outer spathe-valve is green, with a broad, brown, membranous margin, and 5–6 lines long; the inner brown, membranous. The perianth-segments of the outer whorl are 4 lines long by $1\frac{1}{2}$ broad, with a dark-coloured midrib projecting as an apiculate apex; those of the inner whorl are broader (2 lines), with a rounded apex. Capsule not seen.

Hab. Milanji, 6000 ft., Oct. Nos. 14 & 81.

Near *A. alata*, Baker, from the mountains of the Masai country, but easily distinguished by its very narrowly winged leafless peduncle; it is also allied to *A. abyssinica*, Pax, but the latter has the broadly winged peduncle of *A. alata* and less rigid leaves, while the inflorescence is either a single head, or, if a second small axillary cluster is present, the whole is overtopped by a large bract *.

* ARISTEA TAYLORIANA, Rendle, sp. n. Herba foliis 3–6-pollicaribus, radicalibus, rigidis, linearibus, superne attenuatis, acutis vel subpungentibus; pedunculis 4–8-pollicaribus, complanatis, aphyllis, anguste alatis; inflorescentia *A. Johnstonianæ*, sed bractea semper breviore; perianthii segmentis suberectis, fere spathulatis; capsula oblonga rotundata, breviter pedicellata.

The leaves closely resemble those of *A. Johnstoniana*, but are shorter, being 3–6 in. long and $1\frac{1}{3}$ to nearly 2 lines broad; they are generally shorter than the leafless peduncle, which is 4–8 in. long, about 1 line broad, and narrowly winged. The inflorescence resembles that of *A. Johnstoniana*, but the bract always falls short of it; the triangular-acute outer spathes are 5 lines long. The suberect perianth-segments are a vivid blue in colour, almost spathulate

DIERAMA PENDULA, Baker, in Journ. Linn. Soc. xvi. p. 99.

Hab. Milanji, Oct.; South-eastern provinces of Cape Colony, and northward to Natal and Mt. Kilimanjaro.

GLADIOLUS (§ EUGLADIOLUS) MELLERI, Baker, in Journ. Bot. 1876, p. 334.

Apparently a fine form; the flowers and capsules are considerably larger than the type, but I do not think it can be separated as a distinct species.

Hab. Milanji, 6000 ft., Oct. 1891 (*A. Whyte*, nos. 171, 195); Zambesi Highlands (*Meller & Kirk*; Herb. Kew.); Namuli, Makua Country (*J. T. Last*; Herb. Kew; Nyasa-land, 1891 (*Buchanan*, no. 1333; Herb. Kew.).

GLADIOLUS (§ HEBEA) OATESII, Rolfe, in Oates, 'Matabele-land,' edit. 2.

Hab. Milanji, Oct. 1891 (*A. Whyte*); Matabele-land (*Oates*); Zambesi Highlands (*Buchanan*, no. 464); Transvaal (*Holub*).

CYRTANTHUS WELWITSCHII, Hiern, ex Baker, in Journ. Bot. 1878, p. 197.

A smaller plant than the type, but evidently the same species. A very similar specimen was recently collected by Buchanan.

Hab. Milanji, 6000 ft., Oct. 1891 (*A. Whyte*, nos. 130 & 149); Huilla (*Welwitsch*, no. 4028); Nyasa-land (*Buchanan*, no. 993).

HYPOXIS ANGUSTIFOLIA, Lam. Encyc. iii. p. 182.

Hab. Milanji, 6000 ft., Oct., no. 119); Kaffraria; Orange Free State; Tropical Africa (Angola, Moramballa, Zanzibar); Madagascar, Mauritius, and Bourbon.

VELLOZIA (§ XEROPHYTA) SPLENDENS, Rendle, sp. n. (Plate VIII.) Caulescens, sesquipedalis, caudicibus crassis, valide tunicatis, simplicibus vel furcatis; foliis rosulatis, rigidis, vagina brunnea 2–3-pollicari, lamina lineari-subulata, complanata, glabra, margine scabrida; floribus solitariis in axillis bractearum ensiformium, quam pedicelli nigricantes scabridi vix breviorum; perianthii lobis ovati-lanceolatis, apice acuminatis, falcatis; antheris sessilibus ligulatis; ovario turbinato, velut pedunculi scabrido.

Caulescent, about $1\frac{1}{2}$ ft. high. Caudices $\frac{3}{4}$-$1\frac{1}{4}$ in. thick, with a woody cylinder 4–6 lines thick, the rest composed of a mass of imbricating brown sheaths with strong longitudinal ribs; simple or forked. Leaves about six in number, rosulate on the top of the caudex

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in shape, 5 lines long by $1\frac{1}{2}$ broad above the middle; those of the outer whorl are slightly narrower, with a thick, dark-coloured midrib, forming a slightly apiculate apex. The oblong capsule is $\frac{1}{2}$ in. long, on a shorter pedicel.

Hab. Mt. Kilimanjaro, 7000 ft., 1884 (*H. H. Johnston*, no. 14); higher slopes up to 10,000 ft. above Morang (*Rev. W. E. Taylor*, 1888; Herb. Mus. Brit.).

Johnston's specimens are referred in Baker's 'Monograph of Irideæ,' p. 141, to *Aristea alata*, as a dwarfed form of the species, but are distinguished by the leafless and narrowly winged peduncle. *A. Tayloriana* is a smaller plant than *A. Johnstoniana*, from which it also differs in the shape of its perianth-lobes, which are longer, narrower, and more spathulate.

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or its branches, rigid; sheath brown, 2–3 inches long; blade of the outer leaves 1–1½ ft. long, 5–7 lines wide near the base, gradually tapering to a filiform apex; the inner are proportionately smaller, flattened, glabrous, with a scabrous margin, toothed in the young leaf, and a midrib prominent on both surfaces. Peduncle single-flowered in the axil of ensiform, slightly shorter bracts; 6–9 in. long, ½–¾ line thick, thickly covered with short, dark emergences. Perianth-cup very short, fleshy, and covered with protuberances like the ovary. Perianth-limbs ovate-lanceolate, 2¼–2½ in. long by 6–9 lines wide; there is a small scale at the base on either side the insertion of the anther; apex acuminate and falcate; the base of those of the outer whorl covered with black emergences like those on the short perianth-tube, which are also continued up the central veins nearly to the apex, diminishing upwards in size and number. Anthers sessile, inserted on the perianth-limb about 1 line above their base, ligulate, 9 lines long; connective slightly prolonged (½ line) beyond the anther. Ovary turbinate, ½ in. long, clothed with emergences like the peduncle. Style 1¾ in. long.

Hab. Milanji.

The short caudices bear magnificent clusters of flowers, which are larger than in any species hitherto described.

Smilax Kraussiana, Meisn. in Flora, 1845, p. 312.

Hab. Milanji, 6000 ft., Oct., nos. 119 & 152; Natal; East Tropical Africa; Sierra Leone; Cape Verd.

Asparagus virgatus, Baker, in Saund. Refug. Bot. t. 214.

Hab. Milanji, Oct.; Cape of Good Hope; Natal; East Tropical Africa (*Rev. W. E. Taylor*, Herb. Mus. Brit.), Morang and between Zanzibar and Uyui; Maungu (*H. H. Johnston*; Kilimanjaro Exped.).

Asparagus plumosus, Baker, in Journ. Linn. Soc. xiv. p. 613.

Hab. Milanji, Oct.; Cape of Good Hope; Kaffraria; Natal; Nyasa-land (*Buchanan*, nos. 750 & 1470).

Hylonome reticulata, Webb, Phyt. Can. iii. p. 320.

Hab. Milanji Plateau, Oct., no. 60; Cape of Good Hope; Natal.

Drimia robusta, Baker, Saund. Refug. Bot. t. 190.

Hab. Milanji, Oct., no. 6; Cape of Good Hope; East Griqualand (*W. Tyson*, no. 1108).

Urginea maritima, Baker, Journ. Linn. Soc. xiii. p. 221.

Hab. Milanji, Oct., no. 192; Canary Islands; Mediterranean; S. Africa.

Urginea Nyasæ, Rendle, sp. n. Herba bulbo parvo; foliis hysteranthis ignotis; scapo glabro, subcompresso, sæpe flexuoso, inferne purpureo, 7-8-pollicari; racemo

angusto, multifloro (25–50), 2–6-pollicari; bracteis minutis orbiculari-deltoideis, superioribus breviter, inferioribus longe calcaratis; pedicellis ascendentibus; perianthii albidi segmentis lanceolatis, uninerviis; staminum filamentis lineari-subulatis, membranaceis; stylo filiformi; capsula ovoidea, seminibus in loculo 5–10, complanatis, testa atra.

Only part of the evidently small bulb present in the specimen. The larger scapes are 1 line in width; the narrow racemes only attain a width of ½ in. when in fruit; the ascending pedicels are 2–3 lines long. The short membranous bracts have in the upper part of the raceme short spurs in the middle of the back; in the lower part these spurs become much longer, as much as 2 lines. The perianth, which is 2½ lines long, becomes detached at the base, and is thrown off like a cap from the half-ripe fruit. The filaments are thin, membranous, and 1 line long, the anthers ½ line. The filiform style is 1 line long. The green ovoid capsule is 2½ lines long by 1½ broad. The seeds are black and flattened.

Hab. Milanji, 6000 ft., Oct. 1891 (*A. Whyte*); Nyasa-land, 1891 (*Buchanan*).

ORNITHOGALUM ECKLONI, Schlecht. Linnæa, xxv. p. 177.

Hab. Milanji, Oct.; Cape of Good Hope; Natal; Tropical East Africa.

ANTHERICUM, sp.

Flower-buds unopened.

Hab. Milanji, Oct. No. 175.

ANTHERICUM (§PHALANGIUM) MILANJIANUM, Rendle, sp. n. Herba foliis plicatis, late linearibus, utrinque attenuatis, subacutis, sæpius falcatis, basi vaginantibus, subrigidis, papyraceis, multinerviis, margine scabridulis; caule glabro, compresso, subpedali; bractea ima subulata; panicula angusta, 3–4-pollicari, nondum evoluta; bracteis membranaceis, subulatis; pedicellis medio articulatis; perianthii segmentis lanceolatis, albis, 7-nerviis; filamentis filiformibus, glabris; stylo filiformi; capsulo elliptico, seminibus in loculo pluribus superpositis turgidis.

The broadly linear leaves are folded at the midrib, which is thickened like the margins, 8–18 in. long, 7–12 lines broad, with from 36 to 52 longitudinal veins. The flowering stem is sheathed at the base by the leaves, and, including the inflorescence, is 12–15 in. long by 2–2¾ lines broad, with one subulate bract about halfway up. The inflorescence is a narrow panicle 3–4 in. long, the lower subulate bracts ¾ in. long; the lateral branches are short and few-flowered. The flowers were unopened, except one or two on a smaller inflorescence, where there was also one fruit. The perianth-segments are 4½ lines long, white, with 7 delicate green nerves; the filaments are 1½ lines long, the large yellow anthers 2½ lines. The filiform style is 4 lines long. The single elliptical capsule is 3 lines long, and contains several black turgid seeds.

Hab. Milanji, Oct. No. 123.

ANTHERICUM (§PHALANGIUM) NYASÆ, Rendle, sp. n. Foliis radicalibus plicatis, linearibus, acuminatis, apice pungentibus, rigidis, glabris, margine ciliolatis, 10-nerviis, quam scapus multo brevioribus; scapo glabro, firmo, subterete, infra paniculam semipedali (vel minus), bibracteato; bracteis longe acuminatis; panicula laxa, ramis paucis ascendentibus; bracteis subulatis, membranaceis; pedicellis ascendentibus, medio articulatis, inferioribus ternis; perianthii segmentis lanceolatis, albidis, semipollicaribus, 3-nerviis; filamentis quam segmenta plus duplo minoribus, filiformibus, glabris; antheris viridibus; stylo filiformi; capsulis globosis, speciminibus nostris immaturis, seminibus in loculo pluribus.

The stiff linear leaves vary in size up to 9 in. in length and $1\frac{1}{2}$ lines in breadth; the firm glabrous scape is 6 in. long or less; the panicle is generally 8 in. long, and has 2–4 distant, ascending, laxly-flowered branches, 2–4 in. long; the pedicels are in groups of 3 in the lower part and 3–4 lines long; the white perianth-segments are 5–6 lines long and $1\frac{1}{2}$ lines broad, and have 3 well-marked green dorsal veins; the stamens are 3 lines long, the anthers 1 line, the filiform style $3\frac{1}{2}$–4 lines; the few immature globose capsules 2–$2\frac{1}{2}$ lines long.

Hab. Milanji, 6000 ft., Oct.

CHLOROPHYTUM BLEPHAROPHYLLUM, Schweinf. ex Baker, Journ. Linn. Soc. xv. p. 327.

Hab. Zomba, Sept. 1891 (*A. Whyte*); Gallabat (*Schweinfurth*); Transvaal (*Barnes*).

COMMELINA AFRICANA, Linn. Sp. Pl. p. 41.

Hab. Zomba, Sept. 1891 (*A. Whyte*); S. Africa, Angola, Ins. Bourbon

COMMELINA BAINESII, C. B. Clarke, Monogr. Phaner. iii. p. 184; var. GLABRATA, Rendle, var. nov.

Differs from the type in the almost glabrous character of the leaves and the slight pubescence of the internodes; the whole plant of *C. Bainesii* is described as "villoso-pubescens."

Hab. Zomba, Sept. 1891.

C. Bainesii occurs in S. Africa, Transvaal, Bechuanaland, and Angola.

COMMELINA ALBESCENS, Hassk.; Schweinf. Æthiop. p. 210.

Hab. Milanji, 6000 ft., Oct., No. 112; Abyssinia, Arabia, Beloochistan, Scinde.

ANEILEMA SINICUM, Lindl. Bot. Reg. t. 659.

Hab. Milanji Station, Oct., No. 39; S. Africa, Angola, Madagascar, E. India, Java, China.

ANEILEMA ÆQUINOCTIALE, Kunth, Enum. iv. p. 72.

Hab. Milanji, Oct., No. 131; Zomba, Sept.; Abyssinia, Congo, Loango, Angola; Arabia.

FLOSCOPA GLOMERATA, Hassk. Commel. Ind. p. 166.

Hab. Zomba, Sept.; S. Africa, from Cape Colony to the Zambesi; Angola, Madagascar.

ERIOCAULON SONDERIANUM, Körn. in Linnæa, xxvii. p. 669.

Hab. Milanji, 6000 ft., Oct. (no. 115); Cape of Good Hope.

PYCREUS SPISSIFLORUS, C. B. Clarke, sp. n. Mediocris, umbella simplici aut in caput unicum contracta; spiculis spicatis, lanceolatis, compressis, multifloris, fusce luteo-rubescentibus; glumis spisse sitis, ovatis obtusis; stylo 2-fido.

Culms about 12 in. long; rhizome woody, lower sheaths blackened and torn. Leaves $\frac{2}{3}$ the length of the culm, $1\frac{3}{4}$ line broad. Radii of the umbel sometimes reaching $1\frac{1}{2}$ in. in length, more often short or almost absent; bracts 3–5, reaching a length of $2\frac{1}{4}$–3 in., spreading like the leaves. Spikelets resembling those of *P. lanceus*, C. B. Clarke, in shape and size, but with as many as 16–20 flowers. Nut immature.

Near *P. lanceus*, C. B. Clarke, from which it differs in having the glumes much more crowded and a darker colour. The immature spikelets recall those of *P. capillaris*, Nees, but the inflorescence is different, resembling that of *P. lanceus*.

Hab. Milanji, Sept.

PYCREUS NIGRICANS, C. B. Clarke, ined.; *Cyperus nigricans*, Steud. in Flora, 1842, p. 584.

Hab. Milanji, 6000 ft., Oct.; Abyssinia, Intschatkak (*Schimper*, ii. no. 1373); Gafat, 8700 ft. (*Schimper*, no. 1286).

CYPERUS OCHROCEPHALUS, C. B. Clarke, ined.; *Rhynchospora ochrocephala*, Boeck. in Flora, 1879, p. 568.

Hab. Milanji, Sept.; Tropical Africa, Madagascar, and S. Africa (*C. sphærocephalus*, Vahl).

CYPERUS ZAMBESIENSIS, C. B. Clarke, ined., in Herb. Kew.

Hab. Milanji, Oct.; Buchanan, Nyasa-land (no. 647).

MARISCUS cf. DACTYLIFORMIS, C. B. Clarke, ined.; *Cyperus dactyliformis*, Boeck. Cyperac. p. 275.

Hab. Milanji, Oct.; Cape of Good Hope.

The specimens are too young for more definite naming.

MARISCUS SIEBERIANUS, Nees, var. ε. POLYPHYLLA, C. B. Clarke, ined., in Herb. Kew. (*M. polyphyllus*, Steud.)

Hab. Milanji, Oct.; Abyssinia (*Schimper*, no. 1124); E. Africa, between Zanzibar and Uyui (*Rev. W. E. Taylor*, Herb. Mus. Brit.).

This species is widely distributed through India, Malaya to Hong-kong, Formosa, and the Philippine Is., and occurs also in the Mascarene Is. and at the Cape of Good Hope.

Varieties are found in St. Helena and Samoa.

Bulbostylis schœnoides, C. B. Clarke, ined. *Isolepis schœnoides*, Kunth. Enum. ii. p. 208.
Hab. Milanji, 6000 ft., Oct., No. 75; South Africa; Tropical Africa, Angola (*Welwitsch*), and Camaroons, 8000–10,000 ft. (*H. H. Johnston*).

Bulbostylis oritrephes, C. B. Clarke, ined. *Fimbristylis oritrephes*, Ridley, Trans. Linn. Soc. ser. 2 (Botany), ii. p. 155.
Hab. Milanji, Oct.; Angola (*Welwitsch*).

Scirpus costatus, Boeck. Cyperac. p. 457.
Hab. Milanji, Sept.; Abyssinia (*Schimper*).

Fuirena Welwitschii, Ridl. *l. c.* p. 161.
Hab. Milanji, Oct.; Angola (*Welwitsch*).

Ascolepis capensis, Ridley, *l. c.* p. 164; *Platylepis capensis*, Kth. Enum. ii. p. 269.
Hab. Milanji, Oct.; South Africa; Tropical Africa (*Welwitsch*).

Eriospora villosula, C. B. Clarke, sp. n. Herba culmis longis, gracilibus, tenuiter pilosis; foliis lineari-setaceis, vaginis fissis; panicula laxa, sæpe composita; bractea ima magis pilosa, immo villosa; spicis omnibus bisexualibus; stylo 3-fido; setis hypogynis, rigidiusculis, setuloso-scabris.

The culms are a foot or more long, ½ line in diameter, and subterete. The leaves about 9 in. long and 1½ lines wide, with the margins involute when dry. The panicle is 5–7 in. long, with 15–25 spikes; the fasciculed peduncles are as much as 1½–3 in. long below; the pilose bract almost equals the panicle in length, and is sometimes almost hirsute. The spikelets are those of the genus.

Hab. Milanji, 6000 ft., Oct.

Near *E. Rehmanniana*, C. B. Clarke, ined. in Herb. Kew., from the Transvaal, but easily distinguished, as the latter is glabrous and has not the lax panicle of the Milanji plant.

Carex Wahlenbergiana, Boott, ? var. Schimperi, Boott.

The species occurs in Bourbon, Mauritius, and Madagascar; the variety, according to Engler's 'Hochgebirgsflora trop. Afrika,' in Abyssinia "bei Gerra um 2500m" (*Schimper*, 1863, no. 1314), and Fernando Po "um 2500m" (*G. Mann*; = *C. Wahlenbergiana*, *fide* Hook. fil. in Journ. Linn. Soc. vii. p. 225).

It is allied with the wide-spread tropical Asiatic *C. bengalensis*, Roxb.

Hab. Milanji, Oct.

Carex Boryana, Schkuhr, Riedgr. ii. p. 43.

A large form of the species.

Hab. Milanji, 6000 ft., Oct. No. 85.

A native of Bourbon and Mauritius; found also in Fernando Po, *fide* Hook. fil. *l. c.*

Panicum (§Eupanicum) pectinatum, Rendle, sp. n. (Plate X. figs. 1–6.) Cæspitosa, culmis tenuibus, subteretibus, glabris, foliosis, pedalibus et supra, glandulis pedi-

cellatis super nodis pilosis suffultis; foliorum vaginis longitudinaliter sulcatis, inferioribus scabrido-pubescentibus, superiore glandulifero; ligula pilosa; lamina lineari, apice attenuata, glabra; paniculæ ramis ascendentibus vel patentibus, velut ramulis pedicellisque glanduliferis; spiculis ovalibus, subcompressis, gluma 1ma brevi, ovata, 3-pectinata, purpurea, sublinea longa, 2da lata, truncata, 5-nervia, pectinata, 5-dentata, 3^tia^ ovali-oblonga apice irregulariter dentata, 7-nervia, margine purpurea; florifera quam præcedens subbreviore, ovali, apice subobtusa et dorso sparse ciliolata; palea quam gluma includente breviore, sub apice sparse pilosa.

The slender leafy culms are longitudinally striate, 12–21 in. long, and bear a few long-stalked capitate hairs, evidently glandular, below the pilose nodes. The leaf-sheaths are longitudinally ridged, the lower ones scabrido-pubescent, while the uppermost bears the stalked glands in the depressions between the ridges; the ligule is represented by a row of pilose hairs at the mouth of the sheath; the linear blade has a tapering, somewhat cuspidate apex, is longitudinally striate with inconspicuous venation, 3–4 in. long, $1\frac{1}{2}$ lines broad, in the radical leafy shoots often with completely involute margin. The inflorescence is a panicle, with branches ascending or spreading, and giving an ovate general outline 3–5 in. long by 2–3 in. broad; the axis, branches, and pedicels bear the characteristic glands, which are easily rubbed off the dry plant. The oval subcompressed spikelets are $1\frac{3}{4}$ lines long. The short outer glume is $\frac{4}{5}$ line long, consisting in the upper part of three teeth, of which the middle is the longest; the second is purple like the first, but larger, $1\frac{1}{2}$ lines long, and 5-nerved, or with a shorter 6th nerve not reaching the top, with 5 apical teeth; the third is oval oblong, $1\frac{3}{4}$ lines long, 7-nerved, with purplish edges and an irregularly toothed apex; the 4th or flowering glume is very slightly shorter than the third, oval, flattened dorsally, with involute edges firmly enclosing the pale and flower: it is coriaceous with a hyaline margin, the upper third purple, the rest greenish, sparsely ciliolate on the back beneath the subobtuse apex. The pale is slightly shorter than the flowering glume, $1\frac{1}{2}$ lines long, flattened dorsally, with involute margin, subcoriaceous with hyaline edges, glabrous except for a few hairs near the acute apex. The stigmas are plumose. Fruit not seen.

Hab. Milanji, 6000 ft., Oct. No. 10.

This grass is of interest from a biological standpoint owing to the long-stalked glands, which must be of importance in the life of the plant, while from a systematic point of view its pectinate glumes separate it from all other species of the genus *Panicum*. The latter character I was inclined to consider of generic value, but Prof. E. Hackel, whom I consulted, thinks the plant "a true *Panicum*, but somewhat anomalous in the genus on account of its toothed glumes." He also reminds me that, while no *Panicum* is known as yet which offers this character, a similar case occurs in the genus *Muehlenbergia*, where *M. clomena*, *M. gracilis*, and others have the second empty glume three-toothed, a fact which led Beauvois and Nuttall to separate them as distinct genera; modern authors, however, including Bentham, have reunited them with *Muehlenbergia*.

P. pectinatum falls in the section *Eupanicum*, its otherwise normal spikelets, with

their slender pedicels, being laxly arranged on the branches of the panicle. It will form, however, as Hackel suggests, a new series comparable with the other seven into which Bentham divides the section. This series I propose to call *Pectinatæ*.

PANICUM (§ DIGITARIA) MILANJIANUM, Rendle, sp. n.; rhizomate tenui, forsan repente; culmo folioso, subbipedali, glabro, striato; internodiis tribus infimis complanatis, superiore terete; vaginis glabris, ore pilosis, striatis; ligula brevi, truncata, brunnea, membranacea; lamina late lineari, superne attenuata, nervo prominente, scabrido-pilosa; spicis in axe brevi fastigiatis; spiculis in rhacheos triangularis flexuosæ lateribus inferioribus paribus alternantibus ordinatis, subcompressis, unifloris; pedicellis parium inæqualibus; gluma 1ma minima acuta, 2da profunde incisa segmentis pilosis, 3^{ia} maxima a tergo visa lanceolata, cum duabus carinis, pilosis, 4ta florifera late ovata apiculata, dorso rotundata, trinervia, glabra, coriacea, palea consimili, sed obtusa, inclusa; antheris brunneis, stigmatibus plumosis.

The apparently creeping slender rhizome is $1\frac{1}{2}$ lines in thickness; the culm is nearly 2 ft. long; the three lower internodes are compressed, the upper one terete above the leaf-sheath; the nodes are brown and glabrous. The leaves are in a radical tuft and cauline; the sheaths of the former are $2\frac{1}{2}$–3 in. long, of the latter $3\frac{1}{2}$, 5, and 9 in. respectively from below upwards; the ligule is less than a line long, the broadly linear blade tapering above is about 6 in. long by 4–5 lines wide in the middle, with a conspicuous midrib raised above, and numerous less conspicuous lateral veins, scabrido-pilose on both surfaces, but especially on the upper. The inflorescence consists of 15 spikes arranged irregularly on a short axis 2 in. long; the spikes are 6 in. long, the spikelets, $1\frac{1}{2}$ lines long, are arranged in alternating pairs on the two lower sides of the triangular flexuose rhachis; one pedicel of each pair is longer, sharply triangular, and closely denticulate like the rhachis, the shorter being terete, with a few small scattered teeth. The small acute (not short and rounded as in *Digitaria sanguinalis*, Scop.) lowest glume is $\frac{1}{4}$ line long; the second, deeply cut into hairy divisions, is 1 line; the third and largest, appearing lanceolate from behind, has a prominent, minutely denticulate midrib on the flattened back, with two pilose lateral keels, and is $1\frac{1}{2}$ lines long; the broadly ovate flowering glume, with rounded back and thin transparent margin, encloses the similar but blunter and more delicate pale, which is 1 line long.

Hab. Milanji, Oct.

Closely allied to *Digitaria commutata*, Nees, but at once distinguished by the narrow, acute, projecting lowest glume, which in *D. commutata* is equilaterally triangular and less projecting. The leaves are also broader.

SACCHARUM (§ ERIOCHRYSIS) PURPURATUM, Rendle, sp. n.; culmo glabro, nodis 3; vaginis duabus superioribus pubescentibus, infima glabra, innovationum glabris; ligula breviter ciliata; lamina flexuosa, convoluta, aciculari vel subulata, pubescente; panicula parva, ovali, densa, pauciramea; spiculis lanceolatis, sessilibus, quam pili fulvi involucrantes longioribus, pedicellatis eos subæquantibus; gluma

1ma membranacea, ovato-lanceolata, subobtusa, bicarinata, margine inflexa, venis 4 convergentibus, purpurea, marginibus, apice, et carinis pilis fulvis obtectis; 2da hyalina, late lanceolata, acutiuscula, bicarinata, venis 3 convergentibus, marginibus inflexis et carinis supra basin pilis fulvis ciliatis; 3[tia] hyalina, lanceolata, subacuta, enervia, margine inflexa, supra medium ciliata; 4[ta] quam 3[tia] duplo breviore, hyalina, subtrapezoidea, apice incisa, enervia, ciliata.

The culms are 14–17 inches long, with three nodes, the uppermost naked for 2½ inches below the panicle; the lowest sheath on the culm is glabrous, the upper two are pubescent, those of the innovations glabrous; the blades convolute, appearing acicular or subulate, and covered with a silky pubescence; the lowest on the culm is 3 in. long, the upper two about 1 in. and ½ in. respectively, on the innovations 4–7 in. long; they are ½ line in diameter when rolled. The panicle is small, oval, dense, and but little branched, 1½–2 in. long by 6–8 lines broad; the colour is tawny, tinged with wine-red. The sessile spikelets are 3 lines long by 1 broad, with an involucre of stiff tawny hairs about half the length of the outermost glume; the stalked spikelets are 2½ lines long, with a denser, longer, and more spreading involucre, slightly shorter than, or nearly equal to, the spikelet. The outermost glume is 3 lines long by 1 broad, with two stronger lateral veins parallel with the keels and two central ones which anastomose, one or both falling short of the apex; the inflexed margins, the apex, and the upper portion of the two keels bear tawny hairs, the rest of the surface being glabrous; the colour is wine-red. The second glume is nearly 3 lines long by ⅝ line wide, with a midrib and two lateral veins; the upper ⅝ of the keels and the infolded margin almost from the base bear tawny hairs; the third glume is nearly 2½ lines long, veinless; the upper ⅝ of the inflexed margin and the upper half of the surface is hairy, but the hairs are shorter and less coloured than in the last; two rows of hairs in the lower portion recall the keels of the outer glumes; the fourth is about half the length of the third, is ciliated, and has a cut subtruncate apex.

Hab. Milanji, Oct. (no. 8); Nyasa-land, 1891 (*Buchanan*, no. 997).

Allied to the Cape and West Tropical-African species *S. Munroanum*, Hack., but easily distinguished by the smaller inflorescence, the reddish and membranous (not coriaceous) glumes of the sessile floret, and the shorter paler tufts of hair.

Harpechloa altera, Rendle, sp. n. (Plate X. figs. 7–12.) Perennis, cæspitosa, rhizomate duro; culmis tenuibus, foliosis, vaginis fere obtectis, qua nudi pubescentibus, erectis, complanatis, flexuosis, quam folia brevioribus; vaginis longis, lævibus, plicatis, carinatis; ligula brevi, pilosa; lamina lineari, glabra, striata, flexuosa, plicata, valde carinata, margine involuta, apice pungente; spica unilaterali vel disticha, falcata; gluma 1ma membranacea, complanata, scaphoidea, acutiuscula, uninervia; 2da præcedenti simili, sed breviore; 3[tia] florifera, brevissime pedicellata, complanata, lanceolata, apice bifida, carina valida marginibusque dense ciliatis; palea inclusa, hyalina, profunde bicarinata; glumis duabus superioribus minoribus, sterilibus, truncatis, apice emarginatis.

A perennial tufted grass with a hard rhizome; the annual shoots surrounded at the base with the dried persistent leaf-sheaths, of which the internal ones are covered more or less with a woolly pubescence. The slender leafy culm is almost completely covered by the leaf-sheaths, woolly pubescent where exposed, is flattened, erect, flexuose, overtopped by the radical leaves and those of the leafy shoots, 7–10 inches long. The leaf-sheaths are long and smooth; the ligule is reduced to a ring of short hairs; the linear flexuose blades have a strong keel, closely involute edges, and a pungent apex, those of the radical leaves are 8–9 inches long, that of the upper leaf of the culm 1–1½ inches. The inflorescence is a falcate, unilateral, or sometimes distichous spike 1½–2 inches long; the spikelets are 2⅕ lines long, with one flower and two upper barren glumes. The outermost glume is membranous with hyaline edges, compressed and boat-shaped, when opened out narrow, triangular, with a blunt apex, light brown, with a dark keel and no lateral veins, 2⅕ lines long; the second is somewhat similar, but slightly shorter and of a long oval shape; the short rhachilla beneath the flowering glume bears short tufts of hairs. The folded flowering glume is lanceolate, when opened out ovate, with a bifid apex; the sides are delicately membranous, with a purple tinge; the strong keel and margins are densely ciliate, with straw-coloured hairs, 1½ lines long; the included narrow hyaline pale is deeply bicarinate and slightly shorter. The two upper barren glumes are smaller, thin, hyaline, truncate, with an emarginate apex, about 1 line long, the lower oval-oblong, the upper narrower.

Hab. Milanji, 6000 ft., Oct. 1891 (*A. Whyte*, no. 64); Nyasa-land, 1891 (*Buchanan*, no. 163); Transvaal, Aug. 1880 (*Nelson*, no. 14); Natal.

Easily distinguished from *H. capensis*, Kunth, the only species of the genus hitherto described, by its larger, narrower, and less rigid leaves exceeding the spike, which is also narrower and more delicate, the smaller spikelet, the near approach to equality in the two outermost glumes, the shape of the upper barren glumes, and the absence of a third staminate flower.

TRICHOLÆNA ROSEA, Nees, Fl. Afr. Austr. i. p. 17.

Hab. Milanji, Oct.; S. Africa.

TRICHOLÆNA aff. T. LEUCANTHA, Hochst. ex Steud. Gram. p. 92.

No leaves; specimen insufficient for determination.

Hab. Milanji, Oct.

ANDROPOGON HIRTUS, Linn. Sp. Pl. p. 1046.

Hab. Milanji, Oct.; Europe, Asia, and Africa.

KŒLERIA CRISTATA, Pers. Synops. i. p. 97.

Hab. Milanji, Oct.; Nyasa-land, 1891 (*Buchanan*, no. 991); Europe—Caucasus, Siberia.

ERAGROSTIS, cf. E. MINOR, Host, Fl. Austr. i. p. 135.

Material insufficient for determination.

Hab. Milanji, Oct.

Festuca costata, Nees, Fl. Afr. Austr. i. p. 447.
Hab. Milanji, Oct.; S. Africa.

Festuca milanjiana, Rendle, sp. n.; rhizomate subvalido; culmo 1–2-pedali, simplici, erecto, compresso, lævi, folioso, vaginis radicalibus demum in fibras solutis; ligula membranacea, alba, truncata, 1 lin. longa; foliis linearibus utrinque attenuatis, planis vel siccis sæpe convolutis, glabris, supra sulcatis, subtus sublævibus; paniculæ laxæ substrictæ ovalis semipedalis radiis geminis elongatis, ascendentibus, triquetris, lævibus, prope medium divisis; spiculis ovali-lanceolatis, valde compressis, 4-floris; flosculis dissitiusculis, haud coloratis; glumis lanceolatis, subscabridis, sterilibus acutis, fertilibus 5-nerviis, apice bidente, carina in aristam intermediam perbrevem producta.

The leaves which overtop the panicle may be a foot or more in length (including the sheath, the length of the blade being from 6–9 inches) and from 1–1⅓ lines at the widest part; the upper part is long and very attenuate. The panicle is from 5 to 6 inches long; the sterile glumes, which have two conspicuous nerves on each side (a third is rarely present), are 4 lines long and the lowest fertile one 5 lines.

Hab. Milanji, Oct.

Near the South-African species *F. costata*, Nees, and *F. scabra*, Vahl; distinguished from the former by the narrower panicle, more lanceolate spikelets, colourless glumes, and proportionately larger sterile glumes, these being nearly as long as the lower fertile ones; from the latter by its lax panicle, more lanceolate spike, and less scabridity. The culm flattened throughout is also a distinguishing characteristic.

Bromus milanjianus, Rendle, sp. n.; culmo elongato, bipedali, lævi, striato, compresso, folioso; ligula membranacea, alba, truncata, demum fimbriata, 1 lin. longa; foliis elongatis; late linearibus, utrinque attenuatis, planis, supra sparse villosis, subtus lævibus, paniculæ angustæ gracilis semipedalis radiis multis verticillatis ternis, ascendentibus; spiculis compressis, trifloris, lateralibus breviter, terminalibus longe pedicellatis; glumis sterilibus lanceolatis acutis, apice breviter setigeris, inferiore uninervia, altera trinervia; fertilibus glabris, late lanceolatis, inconspicue 7-nerviis, apice profunde bifidis, carina scabridula in aristam flexuosam glumam parce excedentem producta.

The acute tip of the uppermost leaf of the culm falls a little short of the top of the panicle. The leaf-blades may attain a length of 9 in., and are 2½ lines wide at their broadest part. The graceful curving panicle is 6–7 in., the spikelets are 5 lines long. The lowest sterile glume is 2½ lines long and very acute; the upper is broader, 3⅓ lines long and ½ line broad. The lowest fertile glume measures, without the awn, 5 by 1½ lines. Rhachilla pilose beneath the florets.

Hab. Milanji, Oct. No. 9.

Very near the two closely related species from Central Madagascar, *B. arrhenatheroides* and *B. avenoides*, described by Baker in Journ. Linn. Soc. xx. pp. 301, 302, being

remarkable for the deeply bifid flowering glumes and the avenoid habit. It is especially near the former, its spikelets being 3-flowered, but is distinguished by its smaller sterile glumes, slightly broader, very inconspicuously nerved fertile ones, and broader flattened leaf-blade. The awn, moreover, is not sharply geniculate, but flexuose.

GYMNOSPERMÆ. (By A. B. Rendle, M.A., F.L.S.)

Widdringtonia Whytei, Rendle, sp. n. (Plate IX. figs. 6–10.) Arbor monoica; ramis et ramulis fastigiatis, illis teretibus, foliorum vestigiis ligneis notatis, his subteretibus cum squamis arcte spiraliter imbricatis, infra adnatis, supra patentibus subpungenti-

Widdringtonia Whytei.
From a photograph taken at Milanji, alt. 7500 ft., 12th Dec., 1893.

bus; squamis in ramulis ultimis decussatis, subquadratis, apice crassis; strobilis masculis solitariis, terminalibus, ovalibus; antheris 8, decussatis, orbiculari-ovalibus, bracteis geminis, subtendentibus; fœmineis 4–6 in ramulo brevi aggregatis, sub-

globosis, squamis 4 basi connatis subæqualibus, duabus paulo majoribus, oblongis obtusis, dorso rugosis vel subtuberculatis, infra apicem umbone conico armatis.

A magnificent tree, reaching a height of 140 feet, sometimes with a clear straight stem for 90 feet, and a diameter of 5½ feet at 6 feet from the base, sometimes giving off long straggling branches nearer the base. The branchlets bearing the leafy shoots are rough with the woody remains of the squamiform leaves; those of the next higher order have spirally-arranged imbricating scales, with a suboval lower part adnate to the stem and an upper free triangular part with a subpungent apex; the ultimate branchlets have close-fitting decussate quadrate scales with a thickened apex; a transverse section of these shows three longitudinal resin-canals traversing the interior of the tissue, a larger median and two smaller lateral ones. The male cones are solitary, terminal, oval, and consist of eight orbicular-oval, subapiculate anthers, subtended by two spreading apiculate bracts. The female cones are crowded 4–6 together on a short lateral shoot, are subglobose, about $\frac{3}{4}$ in. long and $\frac{3}{4}$–1 in. wide when open. Of the four scales two are slightly larger; they are connate at the base, oblong-obtuse, more or less tuberculate on the back, with a conical spur below the tip; the two internal faces are flat, subconcave below, and smooth or longitudinally striated. Numerous hilar scars round the base of the scales indicate the position of the winged seeds.

The timber is of a pale reddish colour, of excellent quality, and easily worked. The bark on old trees is of great thickness, consisting of layers annually shed and renewed.

According to Mr. Whyte these fine trees are rapidly disappearing before the forest fires, the few left being confined to the upper ravines and valleys, the largest forest finding a comparatively secure habitat in the damp gorges of the Lutshenya valley.

It is of interest to note that the most nearly allied species, *W. juniperoides*, Endl., seems also to be dying out in the Cederberg Mts., for Parlatore says:—"Olim vastas sylvas efformabat, nunc minus obvia."

Hab. Milanji, 6000–8000 ft.

Mr. Whyte's discovery extends the range of the genus into Tropical Africa.

Closely allied to *W. juniperoides* of the Cederberg Mts., Cape Colony, but distinguished by its smaller fruits, with much less tuberculated scales, and also by the shape and internal structure of the leaf-scales on the ultimate branchlets. In *W. Whytei* these are quadrate, with a slightly larger median and two lateral longitudinal resin-canals; while in the Cederberg plant they are more rounded and have one very large canal traversing the centre.

Bentham and Hooker regard *Widdringtonia* as a section of *Callitris*, a genus made up of the North-African *C. quadrivalvis*, Vent., the Australian genus *Frenela*, and the S.-African and Mascarene *Widdringtonia*; Dr. Masters, however, in a recent paper (Journ. Linn. Soc. xxx. p. 16) restores *Widdringtonia*, and I am glad to have the opportunity of keeping it up.

Podocarpus milanjiana, Rendle, sp. n. ? Arbuscula, foliis confertis lineari-lanceolatis, acutis, submucronatis, basi in petiolum perbrevem angustatis et sæpissime tortis,

coriaceis, rectis vel subfalcatis, nervo longitudinali prominente notatis, margine in sicco vix revolutis; amentis masculis 2-3-aggregatis, axillaribus, sessilibus, oblongo-cylindraceis, obtusis, crassiusculis; squamis antheriferis late ovatis, apice rotunde dilatatis; pedicellis fructiferis solitariis, axillaribus, 1-2-floris.

The somewhat crowded leaves are almost sessile, with stomata on the lower surface only, 2–3 inches long, 3–5 lines broad; those of the male specimens are slightly broader than those of the female. The male spikes are 1 inch long by 2 lines in diameter, the fruiting pedicels 4–5 lines long. Only very young fruits were present.

Near *Podocarpus Thunbergii*, Hook. fil., from the Cape, but distinguished by its narrower, longer leaves, and much larger, not solitary spikes. It differs from the allied *P. elongata*, L'Hérit., in its much larger leaves and the form of the male spikes, which are twice as thick, but shorter.

Hab. Milanji, 6000 ft., Oct. Nos. 34 & 39.

MOSSES. (By A. Gepp, M.A., F.L.S.)

Fragments of Dicranum, Leucoloma, Bryum, and Thuidium.

Polytrichum commune, Linn. Sp. Pl. p. 1109.
Widely distributed.

Aerobryum (§ Eriocladium) capense, C. Muell. in Linnæa, xl. p. 262.
Distrib. S. Africa.

Pilotrichella (§ Orthostichella) imbricata, Jaeg. Genera et Species Muscorum, ii. p. 159.
Distrib. E. and W. Tropical Africa.

Pilotrichella (§ Orthostichella) pseudo-imbricata, Jaeg. *loc. cit.*

The Milanji specimens agree closely with a form in Herb. Hampe collected by Hildebrandt in the Comoro Islands, and bearing the MS. name *Neckera* (*Orthostichella*) *decolorans*, Hampe.

Porotrichum dentatum, Gepp, sp. n. Dioicum (?). Rhizoma repens. Caules ascendentes, inferne simplices, foliis sparse vestiti, pollicares, superne flabellati. Flabellum lutescens, complanatum, laxe dendroideum, 1–2-pollicare. Rami pollicares, subsimplices vel irregulariter pinnatim ramosi. Folia caulina e basi lata (1 mm.), amplexicauli, erecto-patentia, deltoideo-ovata, breviter acuminata, haud plicata; ramea e basi angustiore ad alas impressa, patula ovata vel ovato-lanceolata, caviuscula, plerumque plica medio exarata, apice obtuso apiculato, margine late recurvo, inferne serrulato, superne serrato, versus apicem dentato, nervo valido ad $\frac{3}{4}$ evanido, cellulis inferioribus linearibus ad alas impressas brevibus incrassatis, superioribus ovali-rotundatis.

Folia perichætialia pallida, inferne lutea, ovata, longe acuminata, ecostata, margine serrulato. Archegonia circa 25, cum pallidis paraphysibus dense conferta.

This plant somewhat resembles *Porotrichum pennæforme*, C. Muell., in size and general appearance, but differs in the less crowded, more ascending branches, and the areolation of the leaves.

Male flowers not observed. Rhizome 0·25 mm. thick, angulate. Flabellate stems 5–7 cm. long. Stem-leaves 1·5 mm. long; areolation at base lax, irregularly oval, linear above, and towards apex oval, with thick cell-walls sparsely pitted. Branch with its leaves about 1 mm. thick. Branch-leaves 1·25–1·5 mm. long, not complanate normally; nerve often concealed in a deep fold. Perichætial leaves with cells crowded, hexagonal, thin-walled at base; marginal row quadrate, very delicate, linear above, with walls thick, gelatinoid, pitted.

Hab. Milanji.

HEPATICS. (By A. Gepp, M.A., F.L.S.)

Plagiochila Rutenbergii, Gottsche, in Abhandl. naturwiss. Vereines Bremen, vii. p. 338.

The Milanji specimens agree in most respects with Gottsche's description and figures. They differ in having the ala of the perianth in some cases ciliato-dentate (4 cilia) towards the apex.

Distrib. Madagascar.

Lophocolea, sp.

Radula, sp. Near *R. Boryana*, Nees.

Phragmicoma Pappeana, Nees, Synops. Hepat. p. 296.

Distrib. S. and E. Africa.

Lejeunea (§ Lopholejeunea), sp.

Lejeunea (§ Eulejeunea) flava, Gottsche, Lindenb., & Nees, Synops. Hepat. p. 373.

Widely distributed in the Tropics.

Lejeunea decursiva, v. d. Sande Lacoste, Syn. Hep. Jav. tab. xiv.

Our sterile specimen agrees exactly with the figure quoted.

Distrib. Java.

Lejeunea (§ Microlejeunea) gracillima, Mitt. in Journ. Linn. Soc. v. p. 115.

Distrib. Ceylon, Tropical Africa.

Frullania brunnea, Gottsche, Lindenb., & Nees, Synops. Hepat. p. 441.

Distrib. S. Africa.

METZGERIA FURCATA, Dum. Rec. Obs. Jung. i. p. 261.
Widely distributed.

METZGERIA MYRIAPODA, Lindb. in Act. Soc. Faun. et Fl. Fenn. i. (Monog. Metz. p. 22).
Distrib. America.

DESCRIPTION OF THE PLATES.

PLATE I.

Figs. 1–3. *Anemone Whyteana,* Baker fil.

Fig. 1. Plant, natural size.
2. Stamen, enlarged.
3. Carpel, with style, enlarged.

Figs. 4–13. *Impatiens shirensis,* Baker fil.

Fig. 4. Plant, natural size.
5. Standard, side view, natural size.
6. Keel, with spur, side view, natural size.
7 & 8. Lip, front view, natural size.
9 & 10. Sepals, natural size.
11. Stamens, natural size.
12. Peduncle, with ovary, natural size.
13. Portion of leaf, showing serration, magnified three diameters.

PLATE II.

Figs. 1–4. *Eriosema shirensis,* Baker fil.

Fig. 1. Standard, magnified two diameters.
2. One of the wings, magnified two diameters.
3. Keel, magnified two diameters.
4. Legume, magnified two diameters.

Figs. 5–12. *Flemingia macrocalyx,* Baker fil.

Fig. 5. Plant, natural size.
6. Standard, magnified two diameters.
7. One of the wings, magnified two diameters.
8. Keel, magnified two diameters.
9. Stamens, magnified two diameters.
10. Ovary, with style and stigma, magnified two diameters.
11. Legume, magnified two diameters.
12. Transverse section of same to show amount of turgidity, magnified two diameters.

Figs. 13–17. *Dissotis Johnstoniana,* Baker fil.

Fig. 13. Part of plant, natural size.
14. The same, in fruit, natural size.
15. Bud, natural size.
16. One of the small stamens, enlarged.
17. One of the large stamens, showing the elongate arcuate connective, the figure to the left natural size, that to the right being the same enlarged.

Plate III.

Figs. 1–6. *Choristylis shirensis,* Baker fil.

Fig. 1. Part of plant, natural size.
2. Portion of inflorescence, natural size.
3. View of the flower, the two front petals having been removed, enlarged.
4. Fruit, enlarged.
5. Stamen, enlarged.
6. Pistil, enlarged.

Figs. 7–13. *Tryphostemma apetalum,* Baker fil.

Fig. 7. Part of plant, natural size.
8. Portion of stem, with base of leaf, peduncle, and stipuliform appendage, natural size.
9. The same, enlarged to show the relative position of the points of attachment to the stem, of the petiole, peduncle, and stipuliform appendage.
a. Stipuliform appendage.
b. Point of attachment of same.
c. Point of attachment of peduncle.
d. Point of attachment of petiole.
10. Sepal, enlarged.
11. Inner corona and stamens, enlarged.
12. Outer corona, enlarged.
13. Ovary, with styles and stigmas, enlarged.

Plate IV.

Figs. 1 & 2. *Othonna Whyteana,* Britten.

Fig. 1. Portion of plant, natural size.
2. Fruit, with pappus.

Figs. 3–5. *Vaccinium africanum,* Britten.

Fig. 3. Branch, natural size.
4. Flower, enlarged.
5. Upper part of stamen, with anther, enlarged.

Plate V.

Figs. 1–6. *Erica Johnstoniana,* Britten.

Fig. 1. Branch, natural size.
2. Flower, enlarged.
3. The same, without calyx or corolla, enlarged.
4. Upper part of stamen, with anther, enlarged.
5. Lower side of leaf, enlarged.
6. Upper side of leaf, enlarged.

Figs. 7–12. *Erica Whyteana,* Britten.

Fig. 7. Branch, natural size.
8. Terminal shoot with crowded leaves, natural size.
9. Flower, enlarged.
10. The same, without calyx or corolla, enlarged.
11. Upper part of stamen, with anther, enlarged.
12. Leaf, enlarged.

Plate VI.

Figs. 1–3. *Mascarenhasia variegata,* Britten & Rendle.

Fig. 1. Branch, natural size.
2. Flower, enlarged.
3. Portion of corolla-tube, cut open to show stamens, enlarged.

Figs. 4–6. *Stathmostelma reflexum,* Britten & Rendle.

Fig. 4. Branch, natural size.
5. Flower, enlarged.
6. Pollen-carrier, enlarged.

Plate VII.

Figs. 1–3. *Disa zombaensis,* Rendle.

Fig. 1. Portion of stem, with spike, slightly reduced.
2. Front view of flower, after removal of odd sepal and lateral petals, slightly enlarged.
3. Pollinium, enlarged.

Figs. 4–6. *Disa hamatopetala,* Rendle.

Fig. 4. Plant, natural size.
5. Side view of flower, after removal of odd sepal, enlarged.
6. Lateral petal, enlarged.

Plate VIII.

Figs. 1–5. *Vellozia splendens*, Rendle.

Fig. 1. Shoot, slightly reduced.
2. Flower, natural size.
3. Leaf, natural size.
4. Perianth leaf, inside view, showing pair of scales and stamens, enlarged.
5. Stamen, enlarged.

Plate IX.

Figs. 1–5. *Thesium Whyteanum*, Rendle.

Fig. 1. Branch, natural size.
2. Flower, enlarged.
3. Longitudinal section of same, enlarged.
4. Fruit, enlarged.
5. Apex of leaf, enlarged.

Figs. 6–11. *Widdringtonia Whytei*, Rendle.

Fig. 6. Branch, bearing male cones and cluster of fruits, natural size.
7. Transverse section of a branchlet of *W. juniperoides*, showing two opposite leaves with single resin-canal in each.
8. The same of *W. Whytei*, showing the three resin-canals in each leaf.
9. Piece of branchlet and detached leaf of *W. Whytei*.
10. Male cone of same.
11. Seed of same.

Plate X.

Figs. 1–6. *Panicum pectinatum*, Rendle.

Fig. 1. Plant, natural size.
2, 3, 4. First, second, and third empty glumes, enlarged.
5. Flowering glume, enlarged.
6. Portion of peduncle bearing capitate hairs.

Figs. 7–12. *Harpechloa altera*, Rendle.

Fig. 7. Plant, natural size.
8. A spikelet, enlarged.
9. Flowering glume.
10. The same, opened, and seen from within.
11. Pale.
12. Upper barren flower.

F. Morgan del. et lith.

West, Newman imp.

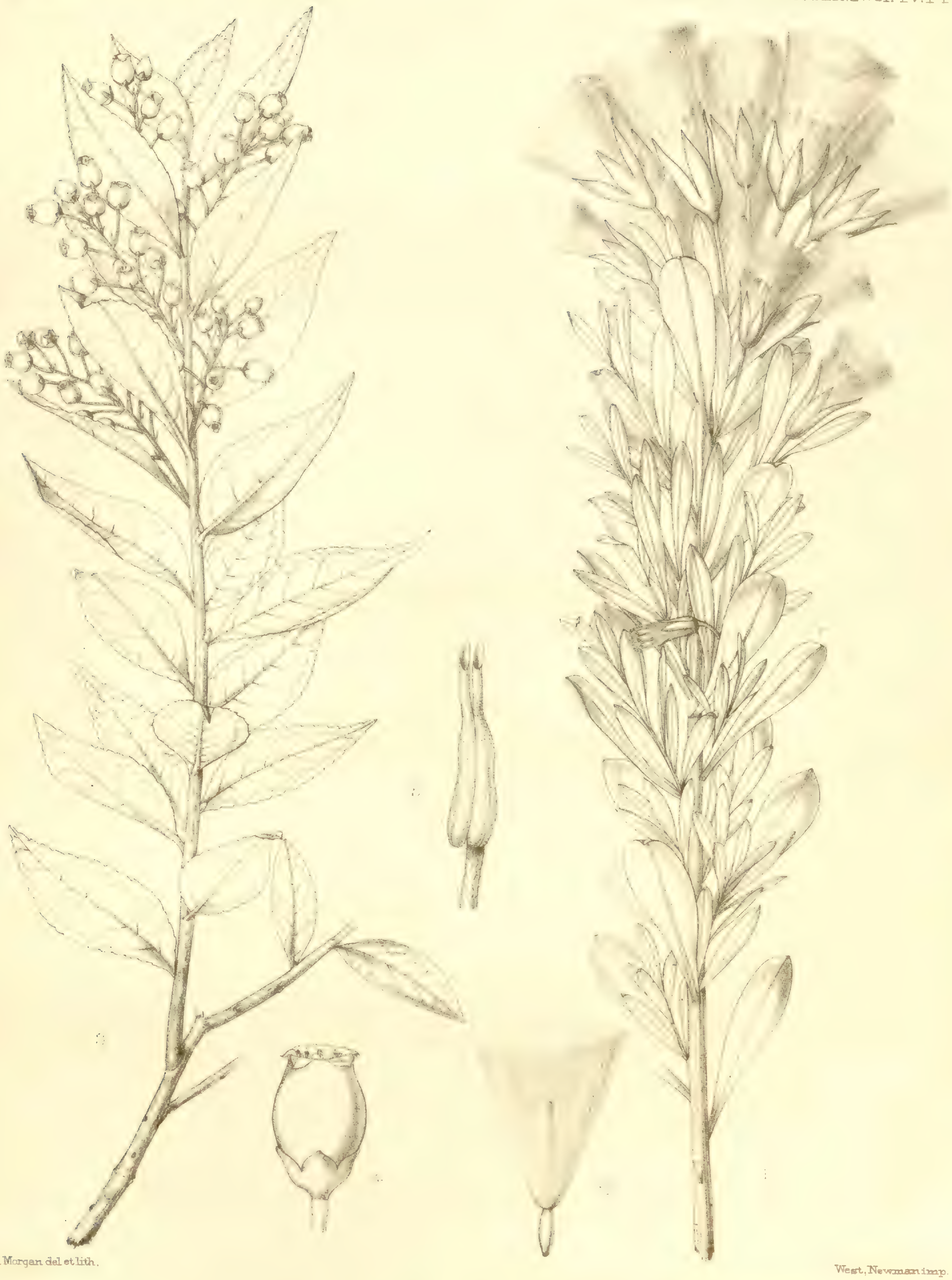
Figs. 1-3. ANEMONE WHYTEANA, *Baker fil.* Figs. 4-13. IMPATIENS SHIRENSIS, *Baker fil.*

R. Morgan del. et lith.
West, Newman imp.

Figs. 1-4. ERIOSEMA SHIRENSIS, *Baker fil.* Figs. 5-12. FLEMINGIA MACROCALYX, *Baker fil.*
Figs. 13-17. DISSOTIS JOHNSTONIANA, *Baker fil.*

R. Morgan del. et lith. West, Newman imp.

Figs. 1-6. CHORISTYLIS SHIRENSIS, *Baker fil.* Figs. 7-13. TRYPHOSTEMMA APETALUM, *Baker fil.*



R. Morgan del et lith.

West, Newman imp.

Figs. 1-2. OTHONNA WHYTEANA, *Britten.* Figs. 3-5. VACCINIUM AFRICANUM, *Britten.*

R. Morgan del et lith.

West, Newman imp.

Figs. 1-6. ERICA JOHNSTONIANA, *Britten*. Figs. 7-12. ERICA WHYTEANA, *Britten*.

R. Morgan del. et lith. West, Newman imp.

Figs. 1-3. MASCARENHASIA VARIEGATA, *Britten & Rendle.* Figs 4-6. STATHMOSTELMA REFLEXUM, *Britten & Rendle.*

Figs 1-3. DISA ZOMBAENSIS, *Rendle*. Figs. 4-6. D. HAMATOPETALA, *Rendle*.

R Morgan del et lith

West, Newman imp

VELLOZIA SPLENDENS, *Rendle.*

R. Morgan del et lith.

West Newman imp.

Figs. 1-5. THESIUM WHYTEANUM, *Rendle*. Figs. 6-11. WIDDRINGTONIA WHYTEI, *Rendle*.

R. Morgan del et lith.

West, Newman imp.

Figs. 1-6. PANICUM PECTINATUM, *Rendle.* Figs. 7-12. HARPECHLOA ALTERA, *Rendle.*

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2nd Ser. BOTANY.] [VOL. IV. PART 2.

THE

TRANSACTIONS

OF

THE LINNEAN SOCIETY OF LONDON.

ON THE FLORA OF MOUNT KINABALU IN NORTH BORNEO.

BY

O. STAPF, Ph.D.,

ASSISTANT FOR INDIA, ROYAL HERBARIUM, KEW.

(*Communicated by* W. T. Thiselton Dyer, C.M.G., F.R.S., F.L.S.)

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II. *On the Flora of Mount Kinabalu, in North Borneo.* *By* O. Stapf, *Ph.D.*, *Assistant for India, Royal Herbarium, Kew.* (*Communicated by* W. T. Thiselton Dyer, *C.M.G.*, *F.R.S.*, *F.L.S.*)

(Plates XI.–XX.)

Read 15th June, 1893.

In May, 1892, Dr. G. D. Haviland, then Curator of the Museum at Kuching, Sarawak, successfully accomplished an expedition to Mount Kinabalu, in North-east Borneo. A set of his botanical collections was sent to Kew, and I was entrusted with the determination of the plants and the description of the new species. In examining them I soon found out that our set contained not only all those species of Sir Hugh Low's collection from the same mountain, which were described by Sir Joseph Hooker in the 'Icones Plantarum' (1852), and in the 'Transactions of the Linnean Society' (1860)—with the exception of *Nepenthes*, of which there is no specimen in Dr. Haviland's collection—but also nearly all the other species from the same collector which were preserved, unnamed or provisionally named by Sir Joseph Hooker, in the Kew Herbarium. The same was the case with a set of specimens collected by Mr. F. W. Burbidge. I decided to include them with Dr. Haviland's collection, particularly as they supplemented it in a very useful way as specimens, as well as by the notes which Sir Hugh Low had attached to them, and not less because I felt that I must not silently pass over the prominent share which Sir Hugh Low had in the exploration of that remarkable mountain. Thus the result was a complete enumeration of the plants hitherto collected on Mt. Kinabalu. The indications of altitude and of many other details on Sir Hugh Low's and Dr. Haviland's labels and numerous notes and sketches in Mr. Burbidge's diary, which he kindly lent me, in combination with the descriptions of the general features of the mountain contained in Low's report on his first ascent (Journ. Ind. Arch. vi. 1852, pp. 1–17), in Spencer St. John's article "Observations on the North-west Coast of Borneo" (Journ. R. Geogr. Soc. xxxii. 1862, p. 217–233), and in the same author's book 'Life in the Forest of the Far East,' in Burbidge's 'The Gardens of the Sun,' and in Whitehead's 'Exploration of Mount Kinabalu,' have encouraged me to draw a sketch of the general differentiation of the vegetation of the mountain in zones of altitude and in botanical formations.* The presence of Australian and Antarctic types in the flora of Kinabalu was already known from Sir Joseph Hooker's publications and from occasional remarks in the 'Genera Plantarum' and in Bentham's 'Flora Australiensis,' but it is much more pronounced in the collection now under consideration. This fact, and the very remarkable phytogeographical relationships of Kinabalu, induced me to also add a paragraph on the phytogeographical affinities of the flora of the mountain. I

* "Pflanzenformationen" of Grisebach, "formations végétales," "formazioni vegetali."

am well aware that conclusions drawn from about 360 species, perhaps one fourth or one fifth of the phanerogamic vegetation of the mountain, cannot be considered final, but they may yet mark a considerable progress if we keep in view that all the hitherto published species from Kinabalu amounted to less than 20 species. In working out the collection I met with the same difficulty which is alluded to by almost every botanist who has had to deal with the Malayan flora—the difficulty which arises from Blume's and particularly from Miquel's practice of describing species from very incomplete material, and from the fact that not a few of the determinations in the collections which were distributed from Leyden are untrustworthy. However, by revising the Malayan material of those genera with which I had to deal in the Kew Herbarium, I have succeeded generally in bringing together trustworthy types of most of the species hitherto described, or at least of those which possibly might come under consideration, thus laying a solid foundation.

The Orchids have been determined and described by Mr. Ridley, Superintendent of the Botanic Garden in Singapore; the Ferns by Mr. J. G. Baker, Keeper of the Royal Herbarium, Kew, and the Mosses by Mr. C. H. Wright, Assistant in the Royal Herbarium, Kew, and by Mr. W. Mitten; whilst Mr. C. B. Clarke has been kind enough to name most Cyperaceæ and to place his descriptions of two new species of *Cladium* at my disposal. It very fortunately happened that Dr. Haviland arrived at Kew just before this paper was ready for press. He obliged me deeply by going through the general part of the manuscript with me and by assisting me with his valuable experience gained on the spot. This entailed, of course, various corrections and modifications, adding, however, I hope, to the value of the paper. He allowed me also to insert an abstract of an account of his expedition which was originally drawn up for private use.

I here avail myself of the opportunity to express my most sincere gratitude to these gentlemen for their kind help, and to add particularly my heartiest thanks to Mr. W. T. Thiselton Dyer, the Director, for the permission to work out this most valuable collection, and to publish the results, and to Professor D. Oliver and my colleague Mr. W. Botting Hemsley, for their assistance in many difficult cases.

I. HISTORICAL ACCOUNT OF THE BOTANICAL EXPLORATION OF MOUNT KINABALU.

From Sir Hugh Low's First Expedition (1851) to Mr. Whitehead's Exploration (1887, 1888).

Mount Kinabalu was first visited by Mr. (now Sir) Hugh Low, who nearly reached the summit, in 1851. A collection made on this occasion was sent to Kew, and the more striking species were described by Sir Joseph Hooker in the 'Icones Plantarum,' vol. ix. (1852), whilst an account of the ascent was published by Sir Hugh Low himself in 'Journ. Ind. Arch.' vi. (1852) pp. 1–17. In 1856 Mr. Thomas Lobb, the well-known collector, attempted to reach the mountain, but he was forced by the natives to return. Some of Lobb's plants in the Kew Herbarium marked "Borneo" may have been collected on this abortive expedition, but there is no

evidence for it, except in the case of a species of *Pinanga* which was obtained at Bongol, on the Lower Tampassuk. In 1858 Sir Hugh Low, accompanied by Mr. Spencer St. John, Consul-General for Borneo, twice repeated his attempt to explore Kinabalu. The first time, in April and May, Sir Hugh Low was compelled to stay at Kiau, on the foot of the mountain, whilst Mr. St. John ascended it almost to the top. The second time, in July, he was more successful, and they both reached a peak which is only second in height to the summit. It was then that the splendid Pitcher-plants were collected, which Sir Joseph Hooker described and figured in the 'Transactions of the Linnean Society,' vol. xxii. (1859), and made the mountain at once famous. A very exhaustive report on both expeditions may be found in Spencer St. John's 'Life in the Far East.' Several later attempts to ascend Kinabalu had no botanic importance, but in 1877 Mr. F. W. Burbidge went there to collect for Messrs. Veitch of Chelsea. A set of dried plants gathered on Kinabalu was sent to Kew, together with others from Labuan, from the Lawas River, and other places in North-east Borneo. As, however, the labels in many cases do not indicate the locality beyond the general printed heading "North Borneo," I have omitted those without the special indication, unless it was evident from Burbidge's book or diary that they were from Kinabalu. In 1887 and 1888 Mr. John Whitehead, an ornithologist, undertook several expeditions to Mount Kinabalu. In 1888 he stayed for more than four weeks at an elevation of about 8000 feet, and he ascended the top under very favourable conditions. Mr. Whitehead collected a few plants, which he presented to the Natural History Museum, South Kensington. His splendidly illustrated book 'Exploration of Mount Kinabalu' contains not only a detailed account of his expedition with several very fine illustrations representing the mountain as seen from different sides and elevations, but also numerous remarks which throw light on the general character of the vegetation. The last and, from a botanical point of view, most successful expedition was Dr. G. D. Haviland's, in March and April 1892, on the results of which the greatest part of the present paper is based. As Dr. Haviland has not published an account of his expedition, I asked his permission to insert an abstract of an account drawn up by him for private use. This abstract, which follows, consists of the copied passages of the account which I thought of interest in connection with the subject of this paper, and Dr. Haviland kindly undertook the revision of it.

Dr. Haviland's Expedition (1892).

Dr. Haviland writes :—" We left Kuching on March 1st, and reached Gaya late on the evening of the 5th. Here we stayed till the 10th, whilst our packages and provisions were being carried by boat to Tawaran. We reached Tawaran early on the morning of the 11th. The river is small, and there is a bar at the mouth. The Government offices are situated about an hour's pull up the river. Beyond there is a large open plain, free from jungle, and thickly populated by Dusuns and their buffalos. The paddi harvest was over, the ground very dry, and the river low. On the 12th we sent our packages up river to a house at the east end of the plain, near the foot of the hills, whilst we and the coolies walked on foot, and we reached the place long before the boat. The river was about

30 yards broad, but in places scarcely more than 2 feet deep, the whole way across with a sandy bed. At daybreak on the 13th the land-breeze from Kinabalu was very strong, and the thermometer read 21° C. We kept along the north bank of the Tawaran till we came to a tributary, which we crossed and followed a short distance before beginning the ascent of the spur between it and the main river. The highest point we reached was 1800 ft. above the sea; from this we could see the Tawaran curving round us to the south. A little further on we reached a scattered village, where we passed the night. At daybreak on the 14th the temperature was about 23° C., although our altitude was 1500 ft.; a thick mist filled the valley below us, which must have been the head of the tributary we crossed yesterday. We got off early, and still kept along the mountain-ridge in a direct course for Kinabalu. Everything was very dry, though in the afternoon we saw rain at a distance in the direction of Kinabalu. About midday we reached our highest point, 2700 ft., whence the ridge turns northward, but we kept our eastward course, descended into the valley, and crossed a stream running southwards into the Tawaran; its bed had an altitude of 1500 ft. We still kept eastward and before long came upon the Tawaran itself, now a rapid stream with a very stony bed, and about to our knees in depth; its altitude was about 1500 ft. Keeping along it and crossing it, we soon reached the village of Bongol; here the Tawaran bends round coming from the southward, a tributary only coming from the eastward. The village presented quite a different appearance to any in Sarawak territory, for it stood on pasture-land closely grazed by buffalos. Pinang-palms and cocoanut-trees were scattered about in clumps, and climbing up them were strong tall plants of sirih (*Piper Betle*). We got off early on the morning of the 15th, and after following the river a short distance, again turned eastwards and ascended the single ridge here separating the Tawaran and Tampassuk. The altitude of our highest point was about 3100 ft.; from thence our descent to the Tampassuk was very steep. This river was much larger than the Tawaran at Bongol, but its altitude above the sea almost the same, and we forded it with the water scarcely over our knees. We kept along its eastern bank till we reached the village of Koung, situated on a flat pasture-land with hills rising abruptly from its sides and the Tampassuk coursing through it. A drizzling rain at 3 P.M. indicated our proximity to the mountain and a change of weather.

"We crossed the river on the morning of the 16th, and kept along its western bank. On reaching the Kadamaian, the most southerly branch of the Tampassuk, our party divided, the larger crossing it and ascending the northern slopes of the ridge between the Kadamaian and Penokok, getting splendid views of Kinabalu up the Penokok valley; but I with some Dyaks kept to the valley of the Kadamaian; the water was low, and we crossed and recrossed it several times. At an altitude of about 2000 ft. we left the river-bed and ascended the southern side of the ridge between Kadamaian and Penokok, reaching the village of Kiau, which is situated at about 3000 ft. on the southern slopes of this ridge.

"The next day we went out to look for plants and birds. I descended northwards towards the Penokok. The top of the ridge was about 3500 ft. above the sea, and thence we got a splendid view of the south-western precipices of Kinabalu from their

base. Rocky irregular spurs and hollows covered with old jungle formed the heads of the Penokok and Dahombang, and descended to an altitude of about 3000 ft., where these rivers entered cultivated land, and running westward, separated only by a strip of land, do not join till they reach the entrance of the narrow valley, into which the Kinitaki from the north and the Kadamaian from the south also flow, and which is the commencement of the Tampassuk. The Haiahaia is a tributary of the Penokok, which joins it just as it enters the cultivated area; both seem to drain from the great southern spur of Kinabalu and its western offshoot, on which the village of Kiau stands. The Dahombang is larger than the Penokok, and seems to drain from a part of the very base of the great precipices. Looking across this comparatively broad Penokok-Dahombang valley, we saw it bounded on the other side by a steep ridge somewhat higher than the one we were on and covered by old jungle. Beyond this was the Kinitaki, a still larger river, draining the greater part of the huge precipices, and running parallel to the Dahombang towards Mt. Saduk Saduk till turned southwards by it, and entering the Dahombang a little below its junction with the Penokok. Beyond the Kinitaki must be a watershed joining Mt. Saduk Saduk with the Maripari spur of Kinabalu, and beyond this must be the rivers mentioned by the Dusuns: Lambun, Pengataran *, Liban, and Wariu, entering the Tampassuk in its lower course. The Kadamaian comes from the very top of Kinabalu. Its head at Low's Gully runs down the southern slopes of Kinabalu, passing between the heads of the Kinitaki, Dahombang, and the Penokok on the west side, and a branch of the Sugut on the east side, then curving westwards it passes south of Kiau, then north-west till it joins the Dahombang just below that river's junction with the Kinitaki, thus forming the commencement of the Tampassuk in a narrow valley on the south-west side of Mt. Saduk Saduk. In Mr. St. John's map Kalupis is used for what the Kiau men told us was called Kadamaian. On being asked they said Kalupis was a small branch of the Kadamaian.

"Next morning we were up at 4.30 A.M. in hopes of starting early, but it was midday before we were off. The Dusuns had other matters on hand, and they took us only half a mile to a kladi-field † in the valley below.

"Next morning, the 19th, Dusuns came from the village to carry our things, and we started up stream. On our left was the granite peak of Kinabalu, just overtopping the Kiau ridge, and in front was a narrow valley of old jungle, headed by a ridge some 6000 ft. in height, being the long southern spur of Kinabalu, and along this ridge lay our way to the mountain-top. We soon left the kladi-fields, and taking to the river-bed at an altitude of 2600 ft. we passed into the jungled valley, whose sides were at first quite precipitous. We had much clambering over huge slippery boulders, till by midday we reached an altitude of 3200 ft. The northern side of the valley was still inaccessibly steep, but the southern was no longer so, and on starting again we gradually ascended this, still keeping on our eastward course. We now caught sight of a magnificent cascade, the Kadamaian waters entering the valley by pouring over the ridge in front. The stream seemed scarcely to have cut into the rock at all, and for the first 1500 ft. was nearly perpendicular. At 2 P.M. we came to a great overhanging rock.

* Mentioned as "Pantaran" by Whitehead.

† *Caladium esculentum.*

The place was 5000 ft. above the sea, with a good stream of water close by. The Dusuns called it Lobang; here we stayed a week. The rock was large enough to shelter all our party, but, being convex vertically, the shelter was not good. In heavy rain the water ran down almost to the base of the rock before it dripped off. Facing to the west we never saw the sun; shut in by mossy trees we scarcely saw the sky. At daybreak the thermometer was 14° C.; daily the mists set in about 11 A.M., and the rain began at midday.

"Many Bornean heights form knife-like ridges, a few feet broad at the top. Along these is a track probably kept open by deer, on either side of which grow plants. These are almost always in flower and love the sunshine, which can be here felt even through the mist. Among these plants are notably *Vaccinium*, *Rhododendron*, and sometimes Pitcher-plants. A few feet lower the vegetation is completely changed, but nowhere have I seen this change more marked than on this ridge above Lobang, which was the southern spur of Kinabalu. The sides shelved steeply down, and on them grew the sub-summit shrubs with lanky bent and angled stems, densely clothed with long damp moss and lichen, and growing *from* the slope rather than *upwards* in the struggle for the light. Beneath them were no other shrubs or herbs but tangled moss-covered roots. Along this zone, which was more than 100 feet in height, we usually found a fallen fruit closely resembling a chestnut. Below this zone is common jungle of mixed trees, shrubs, and herbs. No bird or squirrel was the same as in the low country, and there were no monkeys. At an altitude of about 6000 feet was a tree, from whose hollow a bear had recently removed a nest of bees. On the morning of the 22nd we followed a well-marked path which we found led to Temburungo, the place where Mr. Whitehead formed his camp at an altitude of 7750 feet. On reaching the top of this ridge we found in front of us the Sugut, behind us the valley of the Kadamaian from which we had just come; on our left was an upper valley of the Kadamaian above the waterfall, a much larger valley than I had expected to find and full of tall jungle-trees. In its lower part it was not steep; above this it stretched suddenly upwards and northwards to the southern slopes of the granite cap of Kinabalu. We had to follow the ridge between this valley and the Sugut a little way before reaching Temburungo. This was just such a swampy spot as in England is loved by *Sphagnum*, Carices, Heaths, Gentians, Asphodel, and *Drosera*. The *Drosera*, however, I could not find; the Asphodel had its representative; the Gentian was a dwarf. There was no running water, but pools of it in holes which had been dug by Mr. Whitehead. We had sunshine and splendid views to the south and to the west. I followed the ridge further to 8000 feet, when it became obscure. On the 26th we went up to Temburungo. Kinabalu had been visible up till noon, and after that was hidden only by white clouds. Up till now the sun had made the place quite warm, but at 3 P.M. the rain began and the temperature rapidly fell to 13°·5 C.

"On the 27th I started for Pakapaka. We kept along the big southern spur of Kinabalu, having sources of the Sugut on our right and the upper Kadamaian on our left. The rise is as great as from Lobang to Temburungo; but it is longer and more gradual. We were soon in mist, and, as all the jungle-plants were dripping with moisture, got wet through. We reached Pakapaka about midday. The cave was formed by a single

slab of granite, and though small it promised good protection, and the mountain torrent just at its mouth gave a good supply of water. The mist and rain increased. Everything got damper and damper. The boulders of rock over which I had at first walked and climbed after plants were gradually submerged in a foaming roaring torrent, descending the hill at an angle of about 20°. Some small shrubs grew behind the large boulders, being protected by them. These were so encompassed and shaken by the water that the torrent could seldom have risen much higher than it was. All the afternoon the cold wind blew up the stream into our cave. At 5 P.M. the temperature of the air was 11° C., of the water in the torrent 10° C. The aneroid read 20·84; the boiling-point was by one thermometer 194° F., by another 90° C. There were quantities of flowering shrubs round our cave and down both sides of the torrent.

"On the 28th the temperature at daybreak was 8° C. About 7 o'clock we started, and were soon again on the ridge overlooking the Sugut. The ridge broadened out, and at about 11,000 feet we found ourselves in quite a different region at the foot of the granite cap, which stood steep and almost bare somewhat on our left. Along our ridge the gradually dwarfing shrubs ran up yet another 1000 feet, forming a thick jungle, and reached to the eastern end of the granite cap. We avoided this jungle, and keeping on the Kadamaian side passed over a flatter area, where many little streams from the granite cap collect and unite before beginning the rapid descent past Pakapaka cave. Here were patches of shrubs in flower, patches of bare rock, and patches of mossy swamps, where grew buttercups, Potentillas, and a small white Gentian. It was a delightfully warm place when the sun was out. We soon began the ascent of the rough granite cap, sloping at first but getting gradually steeper, till we were obliged to make use of ledges. A little higher up the steepness disappeared, and we found ourselves at the foot of a long inclined plane of granite, sloping to us from the north. Low's Gully was in front, but we kept to the west and reached the top of the sharp northern ridge about its middle. It overlooked a lofty precipice, which, with the nearly precipitous sides of a rugged ridge running northwards to Mt. Nohan on the east and a buttress of the largest north-west peak on the west, formed the boundary of a deep valley with perpendicular sides and a narrow outlet to the north-west in the direction of the Pengataran.

"The plants on the top were stunted, only a few inches high, growing only in the crevices of the rock, to which they had a very firm hold, so that it was difficult even with both hands to collect them with their roots. In two hollows shrubs were growing. One was at the foot of Low's Gully, where was the blood-red *Rhododendron*: the other higher up near the foot of St. John's Peak; here I collected *Rubus Lowii*. We stayed about a couple of hours on the top collecting all the time, and returned that afternoon to Temburungo. It was the last fine day we had, and the mist prevented us from ever again getting to 12,000 feet. On April the 2nd we again moved to Pakapaka, and stayed there till the 9th: every day the clouds and mists came up about 9 A.M. and rain began about noon, and by 1 o'clock the stream in front of our cave had become a roaring, foaming, impassable torrent, which subsided in the night.

"At 8 A.M. on the 8th the thermometer read 9°·5 C., the aneroid 20·84, the boiling-point

was 194°·07 F. The altitude of the Pakapaka cave must therefore be 2700 ft. above Temburungo, or 10,450 ft. above the sea.

"On the 10th at 3.30 P.M. the temperature at Temburungo was 15°·7 C., the aneroid 22·90 inches, the boiling-point by one thermometer 92°·8 C., by another 198°·7 F. The altitude of Temburungo must therefore be 7750 ft. above the sea.

"On the 11th we returned to Lobang, and on the 12th to Kiau. On the 14th we moved to the bed of the Penokok river, where we camped till the 24th. On the 18th I visited Maripari, where the aneroid about noon stood at 24·6 inches, which gives the altitude at about 5000 ft. Maripari seems to be on the spur of the great north-western peak which runs out to Mt. Saduk Saduk, separating the Kinitaki from the headwaters of the Pengataran. On the 24th we commenced our return to the coast. We found the rivers swollen and unfordable, and that we had fallen on weather unusually wet even for Kinabalu."

II. OROGRAPHY, GEOLOGY, AND METEOROLOGY.

Orography and Geology.

Mt. Kinabalu is situated in Keppel Province, British North Borneo, 20 miles from Ambok Bay and 30 miles from Gaya Bay. It is the highest mountain of the Malay Archipelago, reaching an altitude of 13,698 feet according to Capt. Belcher, and is not volcanic like most other high mountains of this region. Mt. Kinabalu proper is a huge mass of eruptive (?) granite, which emerges with precipitous, almost everywhere inaccessible, sides from a much and deeply dissected highland. The summit itself is not much more than 2 miles long; but it sends a long spur out from near its eastern end, running N.N.E. This spur culminates in a long, jagged, and narrow ridge, between 10,000 and 11,000 feet high, and breaking off in equally inaccessible precipices; it is most probably formed also of granite. Another spur runs from the south-eastern part to S.S.W. This spur, or rather range, however, has a very different character; it begins where it parts from the granite cap at an altitude of about 11,000 feet, descending soon below 8000 feet. St. John estimates its length at 20 miles; but it is probably much longer and perhaps in direct orographic connection with the mountains from which the Padas and the Kimanis rivers drain; yet it does not seem to rise anywhere to an altitude of more than 6000 to 7000 feet, whilst it is known to descend in the Tambunan Pass, 30 miles south-west of Kinabalu, to 4700 feet. This range, the main range of the highland of Kinabalu, consists, for several miles south from the granite cap, "at first of sandstone, then of black shale, almost as hard as rock" (Spencer St. John, Journ. R. Geogr. Soc. xxxii. p. 233). The ridge is narrow, but, like the steep slopes, covered with dense forest. The jagged northern spur suddenly breaks off, leaving a deep gap between itself and a high peak of conical shape, the altitude of which is estimated at about 8000 feet. Otherwise there is no continuation of the highland in this direction. Numerous other spurs shoot out from the flanks of the granite cap and the northern spur almost in every direction, leaving narrow and steep valleys between them, but not one attains any considerable length. Those on the western side of

the mountain branch off at an altitude of 5000 to 6000 feet, rapidly descending to the bed of the Tampassuk and to an altitude of 1000 to 2000 feet, and thus having enormous precipices, 8000 and more feet high, above them. The south-western spurs branch off at a higher elevation; yet they are by no means longer. A few steep conical peaks of moderate height, as for instance the Saduk Saduk, near Koung, rise from these spurs, west and north-west and at no great distance from Kinabalu. All these spurs seem to consist of sandstone in the lower parts. On some of them a rock, designated as serpentine, has been found cropping out near the granite cap, and Whitehead mentions also "shale." They are evidently all of the same geognostic character as the main range. From the east the lowland of the basin of the Sugut River approaches very closely to Mt. Kinabalu.

As to the geological age of the sandstone and of the Schistose formation of the highland we have not much more than suggestions to make, based upon the analogy with other parts of Borneo which are better known. But Posewitz ('Borneo,' p. 197 &c.) is probably right in attributing the same geological character to this highland which distinguishes the greater part of highland Borneo and the tin islands Banca and Billiton, which are particularly well known. If this be so, the schistose rock would represent what is called the Old Malayan Schistose Formation, which would therefore form the backbone of the highland, from which the granite of Kinabalu proper emerges as an isolated mass, the product of a local but powerful eruption. The sandstone, on the other hand, which skirts the spurs and of which the whole or the greater part of the hilly country between Kinabalu and the north coast is composed, would be Tertiary. The Old Malayan Schistose Formation was hitherto generally considered as Palæozoic, particularly Devonian, and Posewitz places even the eruptions of granite and diorite which are not unfrequent in this region in the Devonian period; but Martin pointed out a few years ago that the Schistose formation is much younger, perhaps even Cretaceous. However this may be, it does not materially affect the assumption that the highland of Kinabalu is old land. According to Posewitz, Borneo was an extensive archipelago in the early Tertiary period, consisting of several large and numerous small islands, and among the larger ones was the highland of Kinabalu, with Kinabalu itself at its northern end. To judge from the rate at which denudation takes place at present the island must have reached a very considerable altitude even then, and the mountains may have been still loftier. The fact that the highland of Kinabalu is not only old land, but old highland, is very important with respect to the history of its flora.

I quote below a few passages from Whitehead's book which, in combination with Dr. Haviland's account on pp. 71–76, will give the reader a better idea of the physiognomy of this remarkable mountain and the surrounding landscape. The first passage, taken from pp. 58 and 59, refers to the view from near the coast, north-west of Kinabalu:—

"The country inland is much broken up by sandstone hills of low elevation, generally bare of trees, and in this month (February) parched and brown, covered with one of the tropical curses, lalang grass. At the back of these lalang-covered hills are others topped with forest, sometimes sharp-peaked and rugged; at the back of all, towering above everything, is that superbly grand mountain Kinabalu. This wonderful mountain looks

more imposing than many mountains of a much greater altitude, from the fact that it is an almost isolated mass, at the highest end mounting up to the height of 13,698 feet (Belcher) and finishing off abruptly in sheer precipices of 10,000 feet; its proximity to the sea-coast, being less than forty miles in a direct line, allows of it being viewed at once from the lowest level, none of its imposing grandeur being lost by a series of intervening plateaus which dwarf so many mountains."

The following passage is taken from page 104, and refers to the view obtained from Melangkap, a village north-west of Kinabalu and close to it:—

"At a glance one could see that the mountain on this side was a sheer precipice and quite inaccessible, the water falling thousands of feet without touching the rock. . . . Between the main buttress (the summit) and the long jagged ridge (the northern spur) is a huge gorge surrounded on three sides by sheer precipices of bare rock, the entrance to this gorge being from the western side, facing Melangkap. At the most southern extremity the mountain suddenly terminates at its greatest altitude by precipices of rock. The top along the whole distance is bare of vegetation and very rough; here and there great scars, formed by rock-slips, may be noticed. Though Kinabalu is only a few miles distant, the intervening country is a mass of forest-clad ridges, which look from here very steep, and through which the Pantaran (a tributary of the Tampassuk) and other streams have cut, in the course of ages, deep channels. . . . The village of Melangkap is situated at the end of a huge spur which runs round in a slight curve almost to the base of the great buttress of Kinabalu. At the Melangkap end the altitude is over 1000 feet, but this spur gradually rises on nearing the mountain to over 5000 feet. It is covered with a dense forest-growth and branches off in several directions, the Pantaran flowing along its base, the head-waters of this river falling from the top of the buttress itself. On looking to your left, when facing the mountain (from the village of Melangkap), another lofty spur sweeps round from the other end of the mountain. This spur is more broken up and about 4000 feet in altitude. . . . Directly in front of Melangkap, and between the two mentioned ridges, the country is a mass of huge spurs, mounting up, as Kinabalu is neared, to 5000–6000 feet."

I may add that the first of the two spurs mentioned parts from the granite cap very near Maripari, a locality spoken of by Dr. Haviland in his account. This will help the reader to join Whitehead's with Haviland's description, which refers to the south-western spurs and to the southern main range.

Meteorology.

The 'Handbook of British North Borneo' contains very valuable information on the meteorological conditions of British North Borneo, derived mainly from observations at Sandarakan and other places on the coast. We may assume that the same conditions prevail also on the coast west and north-west of Kinabalu and for some distance inland. But they undergo a considerable change as we approach the very foot of the mountain, and still more as we ascend it. There is, according to the 'Handbook,' a "true wet season," extending over the months November, December, and January, and often also parts of October and February, and a "true dry season," following almost immediately and

lasting to May, whilst the rest of the year divides between what is called a "moderate wet" and a "moderate dry season." The "true dry season" seems, however, to set in rather earlier, at the end of January or early in February, on the coast near Kinabalu; and February has the reputation of being the driest month even on Kinabalu itself. Yet, whilst the two main seasons are well marked on the coast and drought of considerable duration (as much as 22 days) is known during the dry season, when the open country occasionally assumes a parched appearance, the climate is very equable all the year round on Kinabalu. Even the driest month is here still very wet, and days on which no rain falls are very rare. Thus extreme humidity and equability are the most prominent features of the climate of Kinabalu. The daily periodicity of the hydrometeors (*i. e.* hydrometeoric phenomena) which is so characteristic for the high mountains of Java, and, in fact, more or less for all the high mountains within the Tropics, is very pronounced on Kinabalu. The nights and the mornings are generally clear, with the exception of the bottoms of the deep valleys, where mist collects in the early hours. At 9 or 10 o'clock clouds form on the mountain, which by midday obscure it entirely down to 5000 or 6000 feet. Then rain —sometimes also hail or sleet—falls almost incessantly till late in the evening, when the air clears again. There is, however, a remarkable difference in the extent of the belt of clouds or mist. In Java the clouds form generally between 5000 or 6000 and 8000 feet, leaving the summit more or less free and comparatively dry. This is not the case on Kinabalu, where this belt reaches up to between 10,000 and 11,000 feet, and where also the highest part of the mountain seems to receive an enormous amount of rain, the waters of which partly fall in cascades from the top ridge and partly rush as a foaming, roaring torrent past the Pakapaka cave (at an elevation of almost 10,500 feet). The annual amount of rainfall on the coast ranges from 100 to 157 inches, or from that of Singapore to not quite that of Buitenzorg; but on Kinabalu itself it must be enormously increased.

The monthly maxima of temperature on the coast range from 80°·88 F. in February 1885 to 92°·65 in April of the same year, and the monthly minima from 71°·46 in December 1883 to 78°·0 in April of the same year.

Spencer St. John, who was twice on Kinabalu, in May and in July 1858, found that the thermometer at Kiau, on the south-west foot (at 3000 feet), never marked above 77° during the day, and varied from 66° to 69° during the night. On the Maripari spur at 4700 feet, it marked in July 76° (mean) at midday, 60° at 6 A.M., and 56° (mean) at 6 P.M. At the Pakapaka cave (10,450 feet) he found the temperature ranging from 36°·5 to 43° during three nights in May and 41°·125 (mean) at night in July. On the summit at 1 P.M., exposed to mist and rain, the thermometer marked 52°. Whitehead made daily observations at Temburungo, on the southern main range (7750 feet), from the 1st of February to the 3rd of March. He found the temperature very uniform, the nights varying between 42° and 52°, the days between 60° and 70°. There are various other readings of the thermometer made occasionally by travellers, and in different months, all of which come within the range indicated by the figures quoted. When St. John observed the thermometer fall to 36° all bushes and trees were "fringed with hoarfrost." This makes it probable that even frosts occur occasionally on the top of the mountain; snow, however, has never been seen on Kinabalu.

Another peculiarity of the climate is the small amount of insolation which the slopes and the bottoms of the valleys and even the ridges receive. After three hours' sunshine they get only dispersed light, and not very much of that, as a very great part of the light must be absorbed by the thick belt of mist hovering above or resting upon them. This state of things is naturally intensified on the western, north-western, and south-western sides of the mountain, where the sun rises too late over the huge granite mass to shine long on the deep and narrow valleys, and some of the hillsides exposed to the north certainly never receive even an hour's sunshine.

III. GENERAL CHARACTER OF THE VEGETATION.

A. Zones of Altitude and Botanical Formations.

Relying on the reports of the travellers, and the dried material before me, I distinguish roughly the following zones of altitude on Kinabalu:—

1. The *zone* of the *plains and low hills*, or briefly the *hill zone*, from the litoral zone which skirts the coast as a belt of varying breadth up to 3000 feet.
2. The *lower mountain zone*, from 3000 to 6000 feet.
3. The *upper mountain zone*, from 6000 to 10,500 feet.
4. The *summit zone*, from 10,500 feet to the very summit (13,698 feet).

1. *The Hill Zone* (up to 3000 feet).

I have taken up in the present paper only the flora of that part of the hill zone which forms the very foot of Kinabalu, beginning at the village of Koung, at an altitude of 1600 feet, with the exception of a few plants from the Ulu (upper) Tawaran.

This is the inhabited part of Kinabalu, almost entirely occupied by cultivated land and secondary forest ("young jungle") which springs up rapidly from the clearings as soon as they are abandoned. Towards the coast, part of the plains and hillsides are covered with lalang-lalang, but this does not reach the foot of the mountain. The primary forest ("old jungle") is hardly at all represented within the limits of this zone. The secondary forest is, like the primary forest, essentially evergreen, and has, of course, all the characteristics of a true tropical forest.

The descriptions contained in the travellers' reports do not attempt any philosophical classification of the vegetation from a physiognomical and biological standpoint, and they are too vague and incomplete to allow the reader to form more than a very general idea of the differentiation of the vegetation, nor can the dried material and the notes attached fill this gap. I must limit myself therefore—here and later on—to a few remarks concerning those principal formations which I find distinctly recognizable. These are, in the hill zone:—

a. *The Secondary Evergreen Tropical Forest* ["Young Jungle"].—I find 40 phanerogams and 7 vascular cryptogams referable to this formation. Three of the phanerogams are trees, 21 shrubs, 7 climbers, and 8 herbs. Not one of these is mentioned anywhere as particularly striking or forming a prominent feature in the physiognomy of this forest, if we except two species of *Bauhinia* and perhaps *Mussænda coccinea*, which attract the traveller's attention by their extremely showy flowers, and a few large ferns. Yet there must be here, as anywhere else, a number of species which are more pro-

minent or more numerous in individuals than others, thereby becoming leading features and giving the forest a specific physiognomical and biological character which varies according to its composition. In fact, travellers mention certain plants and certain types of vegetation, as climbers, epiphytes, palms, &c., as especially characteristic, and, moreover, I am told that the natives know very well how to distinguish not only young and old jungle, but also the various types of both. But collectors do not seem to have made an attempt to gather specimens methodically of these more prominent and commoner types in order to ascertain what is their systematic position. This may be largely due to the difficulty of getting such specimens and to want of time; but also to the prevalent illusion that the commoner forms to which the eye soon gets used are less desirable in collections, and that the discovery of new species is the sole aim of the explorer. Yet what could be more important in exploring a new country —from a scientific as well as from a practical standpoint—than to grasp, above all, the broad salient features, and to exhibit them in descriptions and in authentic specimens? I here mention this, not in order to cast any blame on the explorers of Kinabalu, but because I have very often felt, in studying parts of the Malayan flora, how useful and desirable it would be if travellers and collectors would pay more attention to this most important branch of phytogeography—I should call it descriptive phytogeography—which found so skilful an interpreter for the flora of Java in Junghuhn, many years ago.

To return to the "young jungle" formation of the hill zone, I may mention plants not represented in the collection, such as various palms referred to the genera *Areca*, *Pinanga*, *Calamus* by Burbidge, and a species of *Korthalsia* which I recognized from one of Burbidge's sketches. Bamboos play also a prominent part in this forest, and they are said to rise in immense feathery clumps to 50 or 60 feet on the river between Koung and Kiau, and to skirt the torrents and streamlets of the higher valleys with luxuriant growth. How far the two species of Bambuseæ, represented in the collection, share in forming these clumps and belts I do not know. In clearing the land the "old jungle" is never so completely destroyed as not to leave now and then solitary trees or groups of trees, and even larger plots of the original vegetation, and it seems that the presence of tree-ferns on the hillsides near Koung and elsewhere must especially be traced back to such an origin.

As to the systematic character of this vegetation, so far as it is represented in the collections, see the table on p. 119.

b. *Cultivated Land.*—The cultivated land is limited to the regions below 3000 feet. It consists of clearings made in the jungle by felling and subsequently burning the wood. The most important crops are kaladi or kladi (*Caladium esculentum*) and rice; then follow sweet-potatoes, yams, bananas, tobacco, gourds, melons, cucumbers, chillies—*i. e.* several varieties of *Capsicum fruticosum* and *Capsicum annuum*, *Piper Betle*, &c. Of palms, the Sago and Cocoa palm, species of *Areca*, and *Oncospermum filamentosum* are now and then seen near the houses of the natives, and occasionally also orange- and lime-trees and a kind of *Artocarpus*. There are a few weeds, gathered in the kladi-fields or round the houses, in the collections; they are the commonest Malayan species, and no particular interest attaches to them.

2. *The Lower Mountain Zone* (3000 to 6000 feet).

This zone is equivalent to Junghuhn's "Zweite Gewächszone" (second botanical zone) or "Gemässigte Region" (temperate region), which he, however, limits to from 2000 to 4500 feet.

According to St. John, a "fine jungle" occupies the slopes from 3000 to 6000 feet on the "main spur" (the southern main range), whilst it is partly replaced by an exceedingly stunted vegetation as far down as 4500 feet on the Maripari spur, probably, as he suggests, on account of the nature of the soil, "being formed of decomposed serpentine, containing much peroxide of iron"; but above that there is again fairly-sized forest even in exposed situations. A similar forest occupies, it would seem from Whitehead's book, also the north-western spur on the Pantaran. We may infer that this forest is occasionally interrupted by other formations or more or less modified: for instance, along the torrents and streamlets, on exposed ridges, or in connection with the varying character of the soil and the exposures and inclination of the slopes. That this is the case may also be understood from occasional remarks in the reports of travellers. These reports are, however, too incomplete to allow me to give more than a very general description of the principal formation, which no doubt predominates almost exclusively, and a few notes on another formation of very limited extent, but very pronounced character. These formations are:—

a. *Primary Evergreen Forest* ["Old Jungle," "Schattenreiche Hochwaldung" (umbrageous high-forest) of Junghuhn].—I refer to this formation about 145 phanerogams, 17 vascular cryptogams, 17 mosses and liverworts. Most of them were collected on the path from the Kadamaian above Kiau to the ridge of the main range, either along the river or on the slope of the main range facing west or north-west. The rest were gathered in the valleys of the Penokok, Haiahaia, Dahombang, and Kinitaki, and chiefly from the sides of the torrents, or on the Maripari spur, which was ascended from the south-west. There is no doubt that the border vegetation is comparatively better represented than that of the interior of the forest, which is generally very difficult to penetrate. This primary forest is described as abounding in fine tall trees, creepers and epiphytes, commonly also in undershrubs, and the ground as carpeted with ferns and mosses, which increase in quantity and luxuriance with the elevation, enveloping trunks and boughs. Herbs intermingle with shrubs, and are associated with ferns and mosses. Fifteen species are designated trees by collectors, but 11 of them expressly "small trees." Of the remaining four, *Mitrephora Maingayi*, *Sterculia translucens*, and *Dysoxylon cauliflorum* may be mentioned. A few slender, graceful palms (*Areca* ?) are also met with throughout this zone, but there are no specimens in the Herbarium. The shrubs are represented by 63 species, but 30 of them are indicated only from the upper limit of the zone (5500–6000 feet), and some of these reach a much higher level, being probably true ridge-plants which occasionally descend lower. Twelve shrubs are *Rubiaceæ*, 8 *Ericaceæ* (including *Vaccinieæ*), 7 *Myrsinaceæ*, 6 *Melastomaceæ*, 4 *Euphorbiaceæ*, 3 *Myrtaceæ*, 3 *Anonaceæ*, and 3 *Styraceæ*. It must, however, be noted that the majority of *Ericaceæ*, *Melastomaceæ*, and *Styraceæ*, and the 3 *Myrtaceæ*

were not collected below 5500 feet. This sequence is not materially altered if we add the few woody climbers which are in the collection: 2 *Melastomaceæ*, *Streblosa urticina*, *Melodorum kinabaluense*, *Æschynanthus magnifica*, and *Smilax heterophylla*, the last two from above 5500 feet. Rattans are also repeatedly mentioned as very frequent, though no specimen has been collected. *Nepenthes Rajah* and *Nepenthes Edwardsiana* are common on the Maripari spur, whilst they do not seem to descend into the lower mountain zone on the main range, owing to their greater need of light, which confines them more or less to the ridge, which is below 6000 feet on the Maripari spur, but above 6000 on the main range. Bamboos are another characteristic feature, growing in thick clumps beneath the trees, as on the main range, or skirting open places on the Maripari spur, or rambling and creeping and "smothering everything," as on the Pantaran spur; but none of these bamboos have been collected. Of the herbaceous plants about 55 species may be referred to this formation, amongst them a dozen orchids, many of these herbs growing chiefly along the torrents, as *Begonia* and *Impatiens*, and only a few being restricted to the upper limit. Twelve are *Orchideæ*, 10 *Melastomaceæ*, 7 *Urticaceæ*, 5 *Rubiaceæ*, 5 *Begoniaceæ*, and 4 *Gesneraceæ*. Amongst the rest *Viola serpens*, *Impatiens platyphylla*, and *Phlomis rugosa* may be specially mentioned. The type of epiphytes is represented by Rhododendrons, which, like other Ericaceæ, have a particular tendency to assume this mode of life, and by numerous orchids, ferns, and mosses; but I have no means of defining them more precisely. The ferns from this zone number 16, of which 9 are limited to the uppermost part, mostly extending into the next upper zone. This is particularly the case with *Hymenophyllum dilatatum* and 5 species of *Trichomanes*, plants dependent on excessive moisture, and *Gleichenia circinata*. The 17 mosses and liverworts from this zone were all collected at or above 5000 feet, except a *Campylopus*, which ranges from 3200 to 9000 feet.

A rather different kind of primary forest is mentioned by Whitehead from high above the village of Kapar; it was distinguished by the absence of thick undergrowth, caused, as he says, by the shade of the high trees.

b. *Bogs.*—The presence of boggy places on the Maripari spur is indicated by a small number of plants which, in a similar association, are found on the boggy spot called Temburungo, on the main range, but at a much higher elevation. They are *Drosera spathulata*, *Utricularia orbiculata*, *Patersonia Lowii*, *Aletris foliolosa*, *Eriocaulon Hookerianum*, and three sedges—*Cladium borneense*, *C. samoense*, and *Schœnus melanostachyus*.

3. *Upper Mountain Zone* (6000 to 10,500 feet).

This zone corresponds roughly with Junghuhn's "Vierte Gewächszone" (fourth botanical zone) or "Kalte Region" (cold region). When defining the lower mountain zone I pointed out that some of the most characteristic elements of that zone are limited to the uppermost part, from 5500–6000 feet, and that not a few of them extend above 6000 feet. This, taken in itself, would suggest hardly more than the presence of a belt of transition where the elements of the conterminate zones mingle. I have, however,

reason to believe that we shall in future be able, with a better knowledge of the mountain and its vegetation, to distinguish an intermediate zone analogous to Junghuhn's third zone or cool region. This zone will probably comprise the uppermost part of my second zone (upward from 5500 feet) and the dense and high, hitherto entirely unexplored, forest which occupies the broad and deep depression from which the cataract of the Kadamaian falls (see p. 74) and the surrounding slopes upward to near the ridges. It would ascend in the sheltered parts of the valley probably to 9000 feet, but leave out the ridges from about 7000 or 6000 feet or still lower down. If this should actually be the case, the name "upper mountain zone" would more appropriately be applied to this hypothetical zone, whilst the ridges would form a zone by themselves of considerable longitudinal extent, but very narrow when measured across, for this ridge-vegetation is less determined by the decrease of temperature than by the amount of light and the exposure to wind.

The difficulties of cutting a path through the primeval forest hitherto compelled all travellers who visited Kinabalu to keep to the very ridge, between 7000 and 10,500 feet, whence our knowledge of the vegetation of my third zone is almost exclusively limited to that of the ridge of the main range. Hence also the want of precision in the definition of what I call the lower and upper mountain zones.

Dr. Haviland (see p. 74) mentions a "sub-summit" vegetation forming a narrow belt of more than 100 feet high, immediately below the proper ridge. He describes it as very different from the "common jungle" below as well as from the ridge-vegetation. It evidently constitutes a very marked formation; but in the absence of a sufficient representation of this "sub-summit vegetation" in the collection I must refrain from discussing it, and limit myself to the ridge-vegetation, which is represented very well indeed in the collection, namely by about 110 phanerogams, 24 vascular cryptogams, and 3 mosses. There are two formations distinctly recognizable, *Primary Evergreen Dwarf Forest* and *Bogs*.

a. *Primary Evergreen Dwarf Forest* [Dwarf "Old Jungle"].—It practically occupies the whole ridge so far as it is known, with the exception of a few open places. This forest consists of small trees and tall shrubs ranging from 10–20 feet, and varying in denseness from almost impenetrable thickets to open spots. The trees are stunted, twisted, and weather-beaten, often being bent across the path. The trunks and branches are clothed inches deep with dripping moss and festooned with long beard-like lichens. Only conifers grow into fine trees here in some more favourable places. The tendency of some of the trees and shrubs to grow gregariously is distinctly noticeable. The foliage of these trees and shrubs is often crowded on short and thick branches; the leaves, sessile or supported by short and stout petioles, are very coriaceous, of a dark green colour, glabrous—at least above—and glossy. They show a marked tendency towards oval and round forms, particularly near the base, and the generally entire margins are not seldom recurved.

Eleven species are designated trees, but, as already mentioned, only a few conifers attain under existing conditions a considerable height, namely *Podocarpus cupressina*, the scale-leaved form of which has been mistaken by some travellers for *Casuarina*,

and *Dacrydium elatum*, both very common. *Myrtus flavida* and *Rhododendron cuneifolium* assume a yew-like appearance, whilst groups of *Rhododendron ericoides* exhibit the *Erica* type, and numerous dwarf oaks (*Quercus Havilandii*) are representative of a closely-allied form (*Q. pruinosa* var. *alpina*, Jungh.), found under similar conditions on the high mountains of Java. The shrubs blossom nearly the whole year, and many of them very freely. Not less than 9 species of *Rhododendron* adorn this ridge with their brilliant flowers collected in dense clusters or scattered among the dark foliage. They, in addition to 5 species of *Vaccinium* and 7 species of *Diplycosia*, render the order of *Ericaceæ* (incl. *Vaccinieæ*) the most conspicuous and numerous of the phanerogamic vegetation of this zone. Some of them become occasionally epiphytal here as elsewhere. Then follow *Rubiaceæ* with 10 species, two of which are climbers, whilst one (*Psychotria densifolia*) was found epiphytal on trees. Few *Rubiaceæ*, however, reach 8000 feet, and only one (*Hedyotis macrostegia*) goes beyond 9000 feet. *Myrtaceæ* number 6 species, amongst which *Leptospermum recurvum* is most conspicuous, covered all over with innumerable white flowers like snow. *Myrsineæ* are represented by 5 species, among them being the dwarf *Embelia minutifolia* and the widely-spread *Myrsine capitata*. *Ternstrœmiaceæ* and *Rosaceæ* number 4 species. Among the former *Schima brevifolia* represents the *Camellia* type, whilst 3 of the 4 *Rosaceæ* are species of *Rubus*, and *Stranvæsia integrifolia* replaces *Photinia integrifolia*, which is found in Java under similar conditions. *Urticaceæ* are represented by three shrubby figs, all below 9000 feet, and *Cupuliferæ* by 1 *Quercus* and 2 *Castanopsis*, the latter also limited to the lower part of the zone. *Styraceæ* number also 3 species (*Symplocos*). Among the remainder I may mention particularly *Elæocarpus sericea*, a representative of the Javan *Acronodia punctata*, Blume; *Rhus borneensis*, a very singular member of the section Venenatæ; the large-flowered *Polyosma Hookeri*; an endemic species of *Leucopogon*; 2 *Laurineæ*; and 2 species of *Loranthus* having large flower-heads and living chiefly on Rhododendrons. Among the climbers may be especially mentioned *Smilax lævis* and a very common *Calamus*, the latter upward to 9000 feet. The Pitcher-plants, however, are by far the most peculiar feature, though most of them are only locally frequent. There are not less than 5 species found on this ridge, some climbing in the trees, as *Nepenthes Lowii*, others rambling in the shrubs or straggling over the ground.

The herbaceous vegetation, so far as it forms a distinct part of the forest, is represented by 15 species, a remarkably small number, of which 8 are *Orchideæ*, 3 *Gesneraceæ*, and one a common Malayan grass. To these 2 or 3 herbs might be added, which though distinctly foreign, namely Austral-Antarctic types, seem to be more or less intimately associated with this formation. They are *Nertera depressa*, *Euphrasia borneensis*, and *Trachymene saniculæfolia*. *Balanophora elongata*, a common parasite living upon the roots of *Ericaceæ*, is here as frequent as it is in Junghuhn's fourth zone or "cold region."

The fern vegetation attains here its most luxuriant development, and, as it seems, the greatest variety, being represented in the collection by not less than 21 species. Two are tree-ferns, and one, *Cyathea Havilandii*, was found at 10,500 feet. The delicate *Trichomanes* and a species of *Hymenophyllum* are limited to the lowest part, whilst the

more robust species of *Polypodium* were chiefly collected at the upper limit. *Lycopodia* become more frequent, and the wiry trailing stems and branches of *L. casuarinoides* —according to Dr. Haviland—often cut the hands of the traveller who tries to penetrate the thickets.

The epiphytic vegetation is certainly very luxuriant also here; but besides the shrubs already mentioned as growing occasionally epiphytic on trees only three orchids are expressly designated epiphytes, and ferns, mosses, and lichens in a very general way.

In comparing this description of the ridge forest on Kinabalu with Junghuhn's description of the primeval forest of the "cold region" of the high mountains of Java, the reader will note several facts which are the more significant as the number of species taken into consideration by Junghuhn and by me is about the same (112 species from Kinabalu against 90 to 100 by Junghuhn). The first thing which impresses itself upon the reader is the evidently great general physiognomical resemblance—see, for instance, pp. 427, 428, and 449 of Junghuhn's 'Java, seine Gestalt, Pflanzendecke, und innere Bauart,' vol. i. (2nd edition); the next, that the species and even the genera are mostly not the same, but mutually representative. On the other hand, the presence of rattans up to 9000 feet; of so many Rhododendrons, also above 7500 feet; of *Podocarpus cupressina*, one of the most characteristic elements of Junghuhn's third zone, upward to 11,000 feet; the prevalence of ferns, the absence of subarboreous Compositæ (*Antennaria*), and the scantiness of the herbaceous vegetation—if we may rely on the collectors in this point—constitute differences worthy of consideration.

b. *Bogs.*—These are confined to a few very limited places, where, on account of particular conditions of the soil, water collects and trees and shrubs cannot get a footing. The vegetation is materially the same as in similar places on the Maripari spur (see p. 83), but a dwarf *Gentiana* and *Trachymene saniculæfolia*, an Australian type, are very remarkable additions.

4. *Summit Zone* (10,500–13,698 feet).

There is no exact equivalent amongst Junghuhn's zones, as the nature of the top portion of Kinabalu and of the summits of the Javan volcanos is so entirely different; but the few analogies which we may expect lie with certain parts of Junghuhn's fourth zone.

Beyond the Pakapaka cave (10,450 feet) the forest dwarfs down to a mere shrubbery, continuing along the ridge towards the eastern end of the granite cap, but otherwise broken up in scattered patches, ascending to 12,000 feet in the narrow and steep gully which bears Sir Hugh Low's name and affords the only means of reaching the summit. Above that shrubs were found only in two hollows. On a flatter area, where many little streams from the granite cap collect and unite before beginning the rapid descent past Pakapaka, boggy patches with buttercups, potentillas, and gentians are scattered between patches of shrubs and patches of rocks, whilst the remainder of the scanty vegetation clings to the rocks, satisfied with the little soil collecting in crevices and holes. By far the greatest part of this zone, however, is occupied by bare rock.

Dr. Haviland took particular care to collect specimens of as many species as he could find here, and we may therefore consider this flora fairly completely represented in the collection. It comprises 52 Phanerogams, 4 Vascular Cryptogams (species of *Lycopodium*), and 5 Mosses, and they are distributed over three formations, namely, evergreen dwarf bush, bog, and the vegetation of the rocks.

a. *Evergreen Dwarf Bush.*—This formation, consisting of a narrow strip extending along the uppermost part of the main range, and of smaller or larger isolated patches, partakes of the character of the dwarf forest into which it passes gradually below 11,000 feet in many ways, being primarily the product of the extreme development of those conditions which influence the ridge-vegetation so effectively and of the scantiness of the soil which the denuded granite—nowhere very favourable to plant-life—affords. The shortening of the axial portions and the consequent crowding of the foliage are carried to an extreme. The general character of the leaves is the same as in the forest immediately below; but the size is mostly much reduced, and the colour still more intense, imbuing the dark green of the vegetation with a brownish tint. The number of species represented in this bush is still very great if we consider the limited area and the high elevation. The shrubs number 26 species, of which 5 are restricted to the very lowest part, and another 5 were not collected above 11,500 feet, whilst still 8 species were found above Low's gully, at 13,000 feet. The list of shrubs is headed also here by *Ericaceæ* with 5 species, then follow *Myrsineæ* with 3 species; but they do not extend above Low's Gully, nor do the 2 conifers of this zone, namely, *Phyllocladus hypophyllus* and *Podocarpus nervifolia*, var. *brevifolia*. The other orders, each of 2 shrubby species, are *Ternstrœmiaceæ*, *Rosaceæ*, *Myrtaceæ*, and *Rubiaceæ*. The 8 species gathered above Low's Gully, at 13,000 feet, are *Rubus Lowii* (in a dwarf form, only a few inches high), *Leptospermum recurvum*, and *Leucopogon suaveolens*, all known also from the third zone; then *Eurya reticulata*, a shrub characteristic also of the highest regions of Sumatra and Java, and *Stranvæsia integrifolia*, both descending below 12,000 feet, and *Symplocos buxifolia*, *Coprosma Hookeri*, and *Drapetes ericoides* from 12,000 to 13,000 feet. *Drapetes ericoides* forms low and very compact tufts,—hardly deserving the designation of shrubs—of a very peculiar habit which is not represented otherwise in the flora of Kinabalu, and it is altogether a foreign element. It grows in the crevices of rocks, and might be perhaps better included with the rock-vegetation. There does not seem to be much herbaceous vegetation immediately associated with the bush, as nearly all the herbs from this zone are expressly stated to grow either in open boggy places or on the rocks. The few exceptions are *Eria grandis*, very common from 10,000 to 12,000 feet on the ground and in the shade of the bush, *Bulbophyllum montense*, an epiphyte, *Balanophora elongata*, and perhaps some of the sedges.

The fern-vegetation is entirely replaced by *Lycopodia*, which, associated with mosses, cover the ground, particularly along the edges of the bush.

b. *Bogs.*—Places exhibiting a more or less boggy character seem to be more frequent here than in the lower zones, particularly in the flatter portion, immediately at the foot of the granite slope; yet they nowhere cover a considerable area. The flora of these bogs consists of not a dozen phanerogams, of little interest so far as their

biological characters are concerned, but very important on account of their geographical relations. On these I shall dwell later on. It will be sufficient to mention here the generic names in order to give an idea of the composition of this peculiar vegetation. They are *Ranunculus*, *Potentilla*, *Haloragis*, *Gentiana*, *Havilandia*, a new genus of Boragineæ allied to *Trigonotis* and *Myosotis*, probably also *Trachymene* and *Euphrasia*, *Aletris*, and a few sedges.

c. *Vegetation of the Rocks.*—There is probably little justification to speak of the vegetation of the rocks as truly distinct from that of the bogs, as the conditions of plant-life afforded by the small accumulations of soil in crevices cannot—in this particular case—materially differ from those of the bogs. The few plants which I have to enumerate here are a variety of *Potentilla leuconota*, *Haloragis micrantha*, *Trachymene saniculæfolia*, in a very stunted form, *Pilea Johniana*, *Platyclinis stachyoides*, *Schœnus apogon*, and two grasses limited to the very top, namely, varieties of *Deschampsia flexuosa* and of *Agrostis canina*.

B. On some Biological Features.

Under this heading I wish to deal briefly with some of the more obvious biological characters of the vegetation, so far as they may be ascertained from the dry material and the notes of collectors.

1. *Foliage of the Forest Vegetation.*—The woody vegetation is almost exclusively evergreen, and I doubt whether there are more than a few shrubs or trees in the Kinabalu collections having periodically deciduous foliage, though I find about 25 species distinguished by thin membranaceous leaves and about as many by leaves which, although much firmer, still might be called membranaceous or papyraceous. It is very remarkable that the species having thin membranaceous leaves are, perhaps with a single exception, limited to the lower mountain zone, and there chiefly to the part below 4000 feet. The other class, to which species of *Saurauja*, *Urophyllum*, *Lasianthus*, *Melastoma*, &c. belong, are more equally distributed. In any case the woody plants having truly coriaceous leaves amount in all the zones taken together to almost 80 per cent., and to more than 80 per cent. above 6000 feet. These coriaceous leaves (see also p. 84) are generally glabrous, and where there is an indumentum in a young state it quickly disappears from the upper side, at least after the unfolding of the lamina, usually leaving a glossy surface of a deep green. The lower side is oftener clothed with a distinct indumentum, which is either softly tomentose or silky, or consists of stiff spreading hairs. A tomentose covering occurs, for instance, in *Polyosma bracteolata*, *Geunsia farinosa*, and in *Quercus Havilandii*, plants of widely different systematic affinities, habit, and habitat. *Elæocarpus sericea*, *Rubus lineatus*, and *Urophyllum lineatum* have silky leaves, the latter chiefly along the nerves which are unprotected in the bud. The leaves of five of the *Myrtaceæ* also are silky, though only so in a very early stage and on the middle nerve alone, evidently a protective contrivance. A strigillose indumentum is very distinct in the young state of *Melastoma*, *Marumia*, *Dissochæta*, and *Saurauja*, yet it disappears gradually when the leaves are fully grown, whilst it is persistent, for instance,

in *Diplycosia chrysothrix* and *D. rufa.* These coarse, often bristly and short hairs are here, as in other cases, much more prominent on the young branches, where they usually persist, after the leaves have become glabrous, on one or on both sides.

Another very characteristic feature is the almost perfect absence of deeply divided or compound leaves. Excepting *Rubus—Dysoxylon cauliflorum, Evodia tenuistyla, Guioa pleuropteris, Pithecolobium bigeminum,* and *Arthrophyllum diversifolium* are the only species having compound leaves. This tendency to simple leaves becomes particularly prominent in the single-leaved *Rhus borneensis,* which is very nearly allied to *Rhus succedanea,* a species having 2–8 pairs of leaflets.

2. *Flowers.*—The comparative scarcity of showy flowers even in the most luxuriant parts of the Tropics has repeatedly been alluded to by travellers. It finds an emphatic expression in the Kinabalu collections, although we must not forget that the tree-vegetation, the tall climbers, and the epiphytes of the two lower zones are very incompletely represented in the collection, mainly on account of the difficulty of gathering specimens from them, whilst they are all within easy reach above, where the vegetation assumes a stunted character. On the other hand, we may expect that plants having relatively conspicuous flowers are more likely to be collected than those which are less attractive. This has been the case in the hill zone in quite a prominent degree. With reference to those species which have either very large and gaily-coloured flowers (e. g. *Melastoma, Rhododendron*), or where smaller flowers are gathered in large and conspicuous inflorescences (e. g. *Ixora, Mussænda*), or where they are scattered in abundance over the surface (e. g. *Leptospermum recurvum*), if we indicate them as *Class I.*, those having very small and inconspicuous flowers (e. g. *Microtropis, Vitis, Euphorbiaceæ, Urticaceæ*) as *Class III.*, and the remainder as *Class II.*, and if we exclude grasses and sedges, we arrive at the following result:—

	Class I.	*Class II.*	*Class III.*
Hill zone	22 per cent.	58 per cent.	20 per cent.
Lower Mountain zone.	8	62	30
Upper Mountain zone.	12	54	34
Summit zone............	12	52	36

The figures derived for the hill zone are of little importance, as this zone is very poorly represented in the collection, and the endeavour of collectors to gather just a few of the most conspicuous plants, as *Bauhinia* or *Mussænda*, is quite manifest. As to the lower mountain zone the reader will remember that the Rhododendrons which are foremost among Class I., become prominent only near the upper limit, and the same applies to three or four other plants ranging in Class I., thus leaving very few really showy plants in the lower and middle part of the second zone. If we further take into consideration that none of the more conspicuously flowering plants of this zone grow gregariously, and that the herbs having gaily-coloured flowers (*e. g.* Melastomaceæ, *Impatiens*) are scattered amongst ferns and moss and beneath shrubs, we must admit that the observations made by travellers as to the want of showiness in tropical vegetation are wholly borne out by the data derived from the collections from Kinabalu so far as the

lower mountain zone is concerned. The case lies, however, differently with the ridge- and the summit-vegetation. The relative number of species with very showy flowers is here about twice as large as in the greater part of the lower zone, and the effect must be the more striking where the number of individuals increases at the same time, and above all on account of the stunted growth of the forest, the flower-treasures of which are placed immediately before the traveller's eyes. The proportion of the three classes is the same in the summit zone as in the ridge flora, but the vegetation is altogether too scanty to be impressive, and particularly the herbaceous vegetation of the bogs and rocks is far from displaying that gaudy show of colours which we are used to associate in our mind with the idea of a truly alpine flora.

White (or white tinged with yellow or pink) and red are the prevalent colours if we exclude the flowers of Class III. More than 90 per cent. of the flowers of the lower mountain zone of which the colour was ascertainable are either white or red, and the proportion of these two colours is 2 : 1 in this zone, whilst yellow and still more blue or violet are very rare. The ridge and the summit vegetation has 75–80 per cent. white or red flowers, the proportion of both colours being again 2 : 1, whilst the rest is yellow.

3. *Fruits.*—Fleshy fruits, mostly berries, are remarkably frequent. They amount to 35–40 per cent., whilst the percentage of plants with seeds, apparently adapted by their smallness for dispersion by wind, is 25–28 per cent., whether we take the vegetation above 3000 feet as a whole or zone by zone. A few plants, as *Parameria, Hoya,* and *Æschynanthus,* possess seeds with long tufts of hairs constituting a sort of flying contrivance, and the pappus of some of the Compositæ acts in the same way. The latter, however, are weeds, confined to the hill zone. Otherwise there is very little that is remarkable in the fruits and seeds with regard to contrivances which might be considered to be means of dispersion. The large percentage of fleshy fruits and minute seeds would seem to point in an eminent degree to the interference of animals and currents of air in their distribution. But the fact that a fruit is fleshy and therefore, in our opinion, attractive to certain birds is no proof that it is really devoured by them, and still less that it is dispersed by them, particularly over a wide area. Observations on the spot, examinations of the contents of the crop and the intestines of shot birds, collections of fruits and seeds found in them, and experiments to ascertain whether the seeds retain their germinating power after having passed the digestive organs of the animals, are the only means, worthy of science, for elucidating the part which the presence of a "fleshy" structure in fruits and seeds plays with regard to distribution. The rest is mere conjecture. We possess already a few observations of this kind from the Malay Archipelago, but they are too few to generalize from them. The distribution of some of the berry-producing plants (as, for instance, *Rubus rosæfolius*, *Nertera depressa*, or *Dianella ensifolia*) by birds, either in the present or in some more or less remote time, is highly probable from the area over which these species range. Yet the fact that so many of the endemic species possess fleshy fruits is extremely unfavourable to the assumption that the *general* object of this particular structure is to act, in the first place, as a means of dispersion, especially over wider areas. It may, of course, occasionally be the case, and with particular effect within a very narrow area, or at a very slow rate and

in combination with other agencies. The same reluctance will be necessary in drawing conclusions from the minuteness of seeds and fruits apparently adapted to the transport by wind. Here, again, very many of the Kinabalu plants having such seeds or fruits are endemic, or they live in sheltered, quiet places, where the action of wind must necessarily be very limited.

IV. ENDEMISM.

To speak of the endemism of a district so little known and forming part of a likewise imperfectly explored flora is a very difficult task, and I do it only under a certain reservation. Better material, and particularly more experience concerning the variability of the plants, will no doubt enable us in future to reduce some of the endemic forms to already described species of a wider range, and others may be found in other parts of Borneo or of the Archipelago. I have, however, reason to believe that the number of endemic species from the three upper zones will not be very considerably lessened, especially if we take the *highland* of Kinabalu, not exactly Kinabalu proper, as basis. I have, for instance, lately worked up the whole Kew material of Thalamifloræ of North Borneo, from the west frontier of Sarawak to the east coast of British North Borneo, and besides gone through Dr. Haviland's more recent and very ample collections from Sarawak, without coming across more than one of the species which I had originally taken to be endemic on Kinabalu. Thus the fact that the flora of Kinabalu is extremely rich in endemic species may be considered as well established.

The endemic Phanerogams number 199 out of 342, or 58 per cent., but their distribution over the four zones is as follows:—

Zone	I.	II.	III.	IV.
Number and percentage of endemic species.	8 (19 per cent.)	89 (57 per cent.)	74 (65 per cent.)	30 (59 per cent.)

Among the 8 endemic species of the hill zone are three or four species which some botanists, holding a wider view with regard to the limitation of species (for instance in the sense of Bentham in his 'Flora Australiensis'), would perhaps refer to already known species of a wider range. This would reduce the percentage of endemic species within the hill zone to not much more than 10 per cent., a comparatively very low figure. Above 3000 feet the percentage of endemic species is very high. It is a little higher in the ridge-vegetation than below 6000 feet, but the difference is not very great. In the summit zone it seems again to decrease. We must, however, distinguish here between the bush and the vegetation of the open land (bogs and rocks), the proportional share of endemic species in the bush being 2 in 3, but only 1 in 2 in the open land vegetation. Thus it is manifest that the decrease of endemism in the summit zone is solely due to the flora of the open land, which is about as rich in species as the bush, and contains more elements of a wide range, particularly amongst sedges and grasses. The bush itself, however, exhibits the same extraordinary endemism which distinguishes the forest of the main range.

If we arrange the more important orders represented above 3000 feet according to their proportional share of endemism, we get the following sequence :—

Orders.	Total.	Endemic.	Per cent.
Rubiaceæ.................	30	29	96·6
Ericaceæ	32	29	90·6
Myrtaceæ	9	8	88·8
Urticaceæ	13	11	84·7
Styraceæ.................	6	5	83·5
Orchideæ	24	18	75·0
Gesneraceæ..............	7	5	71·4
Melastomaceæ	21	14	66·6
Ternstrœmiaceæ	6	4	66·6
Anonaceæ	5	3	60·0
Nepenthaceæ	5	3	60·0
Myrsinaceæ	17	9	53·0
Euphorbiaceæ...........	6	3	50·0
Filices....................	49	11	22·4

There are 17 phanerogamic genera with more than 3 species above 3000 feet; they are arranged according to their proportional share of endemic species :—

Genera.	Total.	Endemic.
Urophyllum..............	5	5
Psychotria	4	4
Lasianthus	4	4
Vaccinium	7	7 (?)
Elatostemma	5	5
Diplycosia	11	10
Rhododendron...........	12	10
Symplocos	6	5
Bulbophyllum	6	5
Embelia	5	4
Begonia	6	4
Sonerila	5	3
Nepenthes	5	3
Eria.......................	4	2
Ardisia	7	3
Rubus	5	1
Carex	4	0

Thus it appears that *Diplycosia*, *Rhododendron*, and *Vaccinium* have produced the greatest number of species peculiar to Kinabalu; Ericaceæ are therefore the great leading feature in the flora of Kinabalu.

The generic endemism is surprisingly small, being confined to the genera *Havilandia*, a Boraginea allied to *Myosotis* and *Trigonotis*, and *Scyphostegia*, a somewhat doubtful Monimiacea and a perfectly isolated type.

V. AFFINITIES.

I place four tables at the end of the general part of my paper, one for each zone, showing the distribution of the species enumerated in the special part, with the exception of the commonest weeds of the hill zone, in order to facilitate the review of the complex geographical relationships of the flora of Kinabalu. The reader will find some explanatory notes on the areas and the signs used by me at the head of the tables. In this place I wish only to mention that the areas as they are defined do not claim to be exactly phytogeographical divisions, although I have tried to conform them to the corresponding divisions as closely as I could without unduly multiplying them or impairing the clearness of the tables. The great number of endemic species, many of which are distinctly representative forms, led me to introduce the sign ~, indicating that a species is represented by a more or less closely allied form in another area. The same sign was further used in a few cases of non-endemic species, when they were represented outside their undoubted area by so closely allied forms that their specific autonomy seemed to me doubtful.

I purposely placed Borneo in the middle of the tables and grouped the other areas to the right and left according to their position and distance east or west of Borneo. Thus a glance at the tables reveals at once several very remarkable facts, such as the great preponderance of the relations with the remainder of Malaya over those with Austro-Malaya and the Philippines, the considerable number of species—identical or representative—common to Kinabalu and the Himalaya region, and the comparatively large share of what we might call Austral-Antarctic elements. Yet a mere comparison of the arithmetical results derived from the tables would be greatly misleading in several important points concerning the affinities and the history of the flora. In fact any conclusions drawn from results obtained by tabulation must be subjected to a careful scrutiny before they become valid. The total area of the species and of the natural groups of which they are members, the grouping of the members of each group within their common area and their phylogenetic relations, the conditions which influence their spreading or their extermination, and the geological history of the corresponding part of the surface of the earth, are the most prominent points to be considered. I need not point out how very little we know at present in regard to almost every one of these questions. However, I have tried to ascertain as much as I could from the splendid material at Kew and from literature, in a necessarily limited time, and I place the results before the reader in full consciousness of their incompleteness. They agree in many points with Hooker's researches on the diffusion of Boreal types across the Archipelago to Australia and of Australian and Antarctic types in the reverse direction, in his classical Introductory Essay on the Flora of Tasmania, with the general outlines of the phytogeography of Malaya as laid down in Engler's 'Versuch einer Entwicklungsgeschichte der Pflanzenwelt,' and with Warburg's latest and important papers on certain parts of the Malayan flora, papers which have the invaluable advantage of being based on independent research. This coincidence makes me feel more confident than would be the case with a different result.

I think it expedient, for the discussion to which this paragraph is devoted, to divide the plants represented in the collections from Kinabalu into three sets: (1) *the flora of the hill zone* (with the exception of the weeds), (2) *the flora of the primary forest above 3000 feet and of the bush of the summit zone*, and (3) *the flora of the bogs and rocks.*

A. The Flora of the Hill Zone.

The three most powerful agencies which cause in the present, and, so to say, before our eyes, important changes in the natural associations of plants in the Malay Archipelago, reducing or exterminating on one side and giving place to new settlers on the other, are the slow but steady advance of the coast-line wherever it is skirted by a mangrove belt, volcanic eruptions, and the clearing of the land from the primary vegetation by man; the last certainly the most extensive of the three causes. It is the only one which comes under consideration in this paragraph. The history of the plateau of Diëng and of the lowland of Balabuan in Java are instances of the comparative rapidity with which cultivated land may be recovered so completely by the most luxuriant forest growth that we should take it for primeval forest never disturbed by man, but for historical proofs of their age. The replacement does not always take place, and it is probably in many cases more or less incomplete. So far as Kinabalu is concerned, I have no indication that the clearings extended at any time much beyond what I have called the hill zone. This part of the country, however, seems to be kept in a perpetual state of secondary forest or of "young jungle" by the constant shifting of the cultivated area. No wonder that not only a number of weeds which generally follow man in this part of the tropics have found their way into the country, but also other elements which spread easily and are more adapted to the peculiar conditions of cleared land, as the increase of light, the decrease of moisture, the reduced stability of the climate, &c. This must ultimately change the individual character of the local floras, the more so the longer it acts, and replace it by a more general character. Poor as the collection of the hill zone is, it nevertheless bears out this deduction. Twenty-one species, or 50 per cent., are common throughout the greater part of Tropical Asia, not a few of them extending at the same time to Australia. To these may be added four or five of the endemic species of this zone on account of their close affinity to so widely-distributed elements. Fourteen other species, or 33 per cent., have a more limited range of distribution; but this covers still the whole of Malaya in eight cases, whilst the species are replaced in West Malaya (outside of Borneo) by representative forms in six cases. Three other endemic species are more individualized, but still distinctly Malayan elements. The only species which remain are *Brookea albicans* and *Scyphostegia borneensis*. *Brookea* is a genus hitherto found exclusively in North Borneo, having no distinct affinities in the Old World floras, and being doubtfully related to a Brazilian genus. The genus *Scyphostegia* is endemic on Kinabalu and still more isolated, systematically as well as geographically. Thus the character of the hill-zone flora is to almost 60 per cent. generally Indo-Malayan and otherwise Malayan, but slightly imbued with a local shading due to the presence of a few endemic species, most of which have no very marked characters.

B. The Flora of the Primary Forest and Bush above 3000 feet.

This flora as represented in the collection comprises about 258 Phanerogams, mostly trees and shrubs, 32 Ferns, and from 6 to 9 *Selaginellaceæ*. As it constitutes the great bulk of the Phanerogams, we may assume that the proportions of the endemic element in the subsequent zones of altitude are about the same as already indicated for the total vegetation (see p. 91). Almost exactly two-thirds of the Phanerogams are endemic species. The endemism, however, increases with increasing altitude to a certain point, when it becomes stable. It is 47 per cent. from 3000 to 5000 feet (exclusive), 65 per cent. from 5000 to 6000 feet (inclusive), and 68 per cent. from above 6000 feet, whilst it was not quite 20 per cent. in the hill zone.

1. *Indo-Malayan Elements.*

If we designate all the non-endemic species of the collection, the distribution of which is limited to Tropical Asia, with the exclusion of Arabia and with the addition of Tropical Australia, New Guinea, New Caledonia, and Polynesia, as *Indo-Malayan* elements, and if we add to them those endemic species which are representatives of such species, or, in any case, distinctly allied to them, we find about 240 species, or 93 per cent., belonging to this class, the remainder being Austral-Antarctic (16) or Boreal (2) elements. The Boreal elements are herbs from the lowest part of the primary forest, whilst the Austral-Antarctic ones are almost peculiar to the highest zones. If we therefore distribute the Indo-Malayan elements according to the three zones, we get the following figures:—

Second zone	97	per cent.
Third zone	90	,,
Fourth zone	71	,,

(i.) *Closer Affinities.*

The Indo-Malayan elements may be classed according to their closer affinities as follows below. The assignment of a species to one of these classes is, of course, arbitrary to a certain degree, and we cannot expect to find any strict lines to go by. The classification should be taken as a whole and judged from its average results, when, I believe, it will be found tolerably correct. The fact that a species is found on Kinabalu and in the Himalaya does not justify in itself its designation as a Himalayan element or type if this name is to have a meaning at all. If the same species or representative species are found in Java and Sumatra or in the Malay Peninsula, and if the natural group of which they form part has its centre in Malaya, whilst the species stands more or less isolated in the Himalayan region, then we may appropriately call the species a Malayan element, notwithstanding its extension into the Himalayan region. We are in a similar position in many other cases, as will be seen from a glance at the tables, where, for instance, a number of species or representative species are indicated for Japan and temperate China, although I have no distinctly Japanese elements to deal with. The truth is that all these elements which are indicated for Japan are foreign to the Japanese flora, or so widely distributed that they are not specifically Japanese. However circumstantial and subject to differences of opinion in detail this way of dealing with the geographical affinities

of a given flora may be, I think it is the only one which is truly rational, and it never can be replaced by the mechanical summing-up of the indications made in the tabulations.

a. *General Indo-Malayan Elements* (elements distributed throughout Indo-Malaya).—I refer 39 species, or 16 per cent., of the Indo-Malayan portion of the flora to this class. One-third are endemic, two-thirds more or less widely distributed; but there are a few species among the endemic ones which approach so very closely to well-known species that some botanists would probably consider them rather as varieties than as species (*Pavetta limbata*, *Ardisia oocarpa*, *Daphniphyllum borneense*). They are pretty equally distributed from 3000 to 11,000 feet, but comparatively numerous in the summit zone, where they amount to 30 per cent. of the Indo-Malayan portion and are mostly endemic. This circumstance, and the fact of their belonging almost exclusively to genera which are apparently very ancient (*Eurya*, *Ilex*, *Myrsine*, *Daphniphyllum*), suggest that they are rather remnants of an old flora than that they owe their presence to some particular capability of spreading, as this is the case with most of the widely-distributed species of the hill zone.

b. *Elements peculiar to the insular portion of Indo-Malaya* (including the Malay Peninsula).—I find only 9 species which are either known from the insular portion of Indo-Malaya only, west *and* east of Kinabalu, or, if endemic, have representative congeners within this limit only, and they would coincide almost entirely with the general Indo-Malayan elements if we took the affinities in a somewhat wider sense. There are, in fact, only two genera (*Pentaphragma* and *Dichotrichium*) which are absolutely limited to the Indo-Malayan Archipelago.

c. *Malayan Elements*.—These amount to 129 species or 50 per cent. of the Indo-Malayan portion of the flora and to almost 40 per cent. of the total vegetation, thus forming the principal feature in the composition of the flora of the forest. They are most numerous between 3000 and 5000 feet (60 per cent.), and least numerous in the summit zone (45 per cent.). Not quite two-thirds of them are endemic species, many, however, closely allied to species from Java, Sumatra, or the Malay Peninsula. The increase of endemism with increasing altitude is manifest also here, but it decreases again in the summit zone. The percentage is 50 from 3000 to below 5000 feet, 68 from 5000 to 6000 feet (inclusive), 75 from above 6000 to below 11,000 feet, 66 from 11,000 feet.

d. *Bornean Elements*.—The species which are limited to Borneo, or, if endemic, have no close congeners outside Borneo, number about 34. All but 6 were collected at or above 5000 feet, and all of them are endemic on Kinabalu except four. They belong chiefly to *Melastomaceæ*, an order in which the flora of Borneo is particularly rich, and to the genera *Vaccinium*, *Rhododendron* and *Nepenthes*. Sir Ferdinand von Mueller considers, however, some of the species of *Rhododendron* and *Vaccinium* described by him from the Owen Stanley Range as very near to species which I refer to this class.

e. *Elements common to Kinabalu and the Philippines only*.—I refer to this class 11 endemic and 1 non-endemic species: 10 of them are found between 5000 and 11,000 feet, and 1 below and 1 above this zone. The majority of them point most

distinctly to Malaya, so that we cannot call them Philippine elements at all. The remaining 3 species are *Evodia subunifoliolata*, *Rhododendron cuneifolium*, and *Rh. ericoides*. The two Rhododendrons are represented by one or two very close allies on the volcano Apó in Mindanao. Sir Ferdinand von Mueller describes *Rhododendron gracilentum* as very similar to *Rh. ericoides*, but I do not know the species, except from description. There may be some resemblance with certain Himalayan species, but the affinity is by no means close enough to trace them back to these, or *vice versâ*. They form a small group by themselves, characteristic of Kinabalu and Mindanao. Yet it is impossible to say whether they are more Philippine or more Kinabalu elements, and, if Sir Ferdinand von Mueller's *Rhododendron gracilentum* is really so closely allied to *Rh. ericoides*, they would be members of a type of far wider and more eastern range. As to *Evodia subunifoliolata* I must refer to the special part. The species is, moreover, too imperfectly known to base upon it any deductions.

f. *Elements common to Kinabalu and Austro-Malaya only.*—I have to mention only 2 or 3 species as closely allied to Austro-Malayan forms, and having at the same time no distinct and close relations otherwise. They are *Medinilla lasioclados*, *Elatostemma Lowii*, and a species of *Myrsine*. The specimen representing this *Myrsine* is too incomplete for description, but sufficient to show a distinct affinity with a small Austro-Malayan branch of the genus. The *Medinilla* belongs to a group represented in the eastern part of the Indo-Malayan region and even extending into Polynesia. The phylogenetic relations, however, of the species of *Medinilla* as well as those of *Elatostemma* are still too obscure to justify me in laying any particular stress upon these instances. This almost entire absence of *pronounced* Austro-Malayan elements is another very characteristic feature in the flora of Kinabalu. Yet it must not be overestimated, as we shall see that other very important relations—relations of a higher order and a more remote date—exist between the flora of Kinabalu and Austro-Malaya.

g. *Elements common to Kinabalu and Indo-China, and belonging to types having a centre in Indo-China.*—The only species to be mentioned here are an *Illicium*, too imperfectly known to be described, and *Stranvæsia integrifolia*. The Asiatic area of the genus *Illicium* covers Indo-China and subtropical China, and extends westward to the Khasia Hills, Lower Burma, and the Malay Peninsula. One species is known from Florida, and another from Cuba. It is one of those archaic genera which once must have had a Circumpacific distribution of which the present areas are only remnants. Whether it had formerly a wider range in the Malay Archipelago, or whether the habitat on Kinabalu marks the south-eastern limit to which the genus advanced from what is at present Continental Asia, we do not know. The genus *Stranvæsia* is known from South-west China, from the Eastern Himalaya and the Khasia Hills. It is closely allied to *Photinia*, from which it differs mainly in a technical character derived from the fruit. There are very few species of *Photinia* which reach the Malayan region. and all of them can be traced back to the Himalayan region or to Indo-China and even temperate China, where they join the true Boreal flora to which the suborder of *Pomaceæ* almost exclusively belongs.

h. *Elements common to Kinabalu and the Himalayan Region only.*—The number of

species which are common to, or mutually represented in, both areas is very considerable, as can be seen from the tables. But nearly all belong either to the class of general Indo-Malayan or Malayan elements, in the latter case representing outliers of the Malayan flora in the Himalayan region. There is one species in the Kinabalu collection which is identical with a species from the Himalayan region, namely, *Sabia parviflora*, and 2 or 3 are representatives of Himalayan species, although they have, so far as we know at present, no very close congeners in the intervening countries. Yet this discontinuation of the areas ceases at once so soon as we take the affinities in a somewhat wider sense. In fact, there is not a single species in the flora of the primary forest and bush of Kinabalu which could be traced back immediately to the Himalayan region as the cradle of the type with anything approaching certainty.

i. *Elements common to Kinabalu and the Ceylon Region only.—Microtropis ramiflora* has been hitherto known to inhabit Ceylon and the Western Ghats only. The Kinabalu plant enumerated under this name agrees so exactly with certain states or forms of the Ceylon specimens that I am not able to distinguish it. In 6 other cases (*Eugenia kinabaluensis*, *E. ampullacea*, *Lasianthus membranaceus*, *L. euneurus*, *L. rotundatus*, and *Glochidion tenuistylum*) the affinity with species from the Ceylon region is strikingly marked in the vegetative character as well as in the floral structure. True, there are numerous species of *Eugenia* and *Lasianthus*, several of *Glochidion* § *Hemiglochidion*, and a few even of *Microtropis*, in Malaya, which are allied in a way to the Kinabalu species, but I do not know a single instance of a somewhat closer affinity. These 7 species stand pretty isolated amongst their congeners in Malaya. The only suggestion concerning them which appears to me rational is to consider these species as belonging to very old types, and as relics of a flora which was in a more intimate connection with the flora of the Ceylon region.

(ii.) *Broader Affinities.*

It will have been noticed that I used the term "element" in a very narrow sense in dealing with what I called General Indo-Malayan elements, Malayan elements, &c. The results derived from the comparison of the primary forest flora of Kinabalu with the conterminous floras *on this base* were very striking in several ways, particularly with regard to the almost entire absence of Austro-Malayan elements in the Kinabalu flora. I have mentioned, however, already that this result would be very different if we based the comparison on groups of a higher order—I will call them briefly *types*—such as genera, if they are very homogeneous, or subgenera and sections, if they are not. I have tried to ascertain these broader affinities and place the result before the reader in the following lines. These types are, of course, spread over wider areas, and their geographical classification will therefore be accordingly more general. We may divide them into the following classes :—

a. *Amphitropical Types* (types common to the Tropics of the Old and New World).—These amount to about 14 per cent. They are, with very few exceptions, of little interest, as most of them are genera, or sections of genera, consisting of species the natural affinities of which are still very obscure. They do not throw, therefore, any particular

light upon the history of the flora. Some are probably very old types, as, for instance, *Myrica*; others may have attained their almost world-wide distribution at a comparatively late date, as *Rubus* § *Idæobatus*; and others, which are already becoming better known, suggest a differentiation more in accordance with their geographical distribution, as, for instance, *Sterculia* § *Integrifoliæ*, which seems to consist of two natural groups, one confined to the Old, and the other to the New World.

b. *Palæotropical Types* (types confined to the Tropics of the Old World generally).—These consist of about 20 per cent. Not a few of them have their present centre in the Indo-Malayan region, extending westward only to the Mascarenes or to Madagascar, or in a few species to Tropical Africa. Thus, *Melastoma* does not go beyond the Seychelles and might better be counted with the Indo-Malayan types. *Nepenthes* extends to Madagascar, but not to Tropical Africa, and has its centre most decidedly in the Indo-Malayan region. The same may be said of *Adinandra*, *Pygeum*, *Eugenia* § *Syzygeum*, *Argostemma*, *Mæsa*, *Embelia*, *Ardisia*, *Alyxia*, *Strobilanthes*, and probably of several more. *Adinandra*, *Pygeum*, and *Argostemma*, for instance, are each represented only by a single species in Tropical West Africa, thus leaving an enormous gap between the two areas inhabited by them. *Dianella* is very widely spread, from Polynesia to Madagascar; but it does not reach the African Continent. Most species of the genus, moreover, being Australian, it would perhaps better be connected with the Austral-Antarctic types. If we may venture to make any suggestion as to the origin of these types, we must say that all the evidence ascertainable is in favour of the Indo-Malayan region. The remaining types, though represented by more and even by numerous species in Tropical Africa also, cannot be said to be more African than Indo-Malayan. In some cases, as *Impatiens* and *Eugenia* § *Syzygeum*, the centre is distinctly more in the western part of the Indo-Malayan region, and the relations with Madagascar and Tropical Africa are rather strong. On the whole, however, these types would not justify the assumption of an "African" branch in the primary forest flora of Kinabalu. All these types extend also east of Kinabalu and to the Philippines, with the exception of *Argostemma*, which does not range east of Kinabalu, although it is known from the Philippines, and of *Adinandra*, which I know from Celebes, but not further eastwards. They are, however, more abundantly developed west of the Macassar line than east of it, where many of them are represented by a few species only.

c. *Indo-Malayan Types* (types confined to the Indo-Malayan region).—I find these represented by 68 genera or sections, or by 56 to 57 per cent. in the primary forest flora of Kinabalu. 25, or two-fifths, are found only west of Kinabalu, 3 extend to Celebes, the rest range more or less eastward, many to Tropical Australia or even to Polynesia. Some of these number many species in Austro-Malaya, as for instance *Medinilla*, but the majority have their centre most distinctly in the wide region between the Sunda Islands and the Himalaya; and there is not a single genus, subgenus, or section among the Indo-Malayan types of Kinabalu which might be considered truly "Austro-Malayan," *i. e.*, having at present its centre in Austro-Malaya, and the same is the case with regard to the Philippines. *Melastomaceæ*, *Rubiaceæ*, *Ericaceæ* (incl. *Vaccinieæ*), *Gesneraceæ*, and *Orchideæ* are the most prominent orders so far as these types are concerned.

d. *Circumpacific Types* (types principally developed in the Indo-Malayan region, but dispersed through the Boreal regions to America).

Illicium.	*Rhus § Venenatæ.*
Ternstrœmia.	*Rhododendron § Eurhododendron.*
Saurauja.	*Symplocos § Lodhra.*
Ilex § Paltoria.	*Quercus § Pasania.*
Perrotettia.	*Castanopsis.*
	Smilax § Nemexia.

Some of these types extend considerably north into the temperate regions, and where they range south of the Equator they certainly converge to the north. They are at the same time absolutely absent from Tropical Africa and the Austral-Antarctic region. *Illicium, Rhus § Venenatæ, Castanopsis,* and *Smilax § Nemexia* are not known to extend east or south-east of Borneo, and only *Rhododendron § Eurhododendron* and *Saurauja* are represented by a greater number of species in Austro-Malaya. It is very difficult to form a more exact idea as to the origin of these types; but we may assume pretty safely that they are very old types, which for the most part developed either in the high mountains of Tropical East Asia or in higher latitudes, but still in East Asia, whence they spread to America.

2. *Boreal Elements.*

The only distinctly Boreal elements in this forest flora are *Viola serpens* and *Phlomis rugosa*. *Viola serpens* has a very wide vertical and horizontal range in the Himalaya, ascending to 10,000 feet (Kilar Pangi, North-west Himalaya, *Watt*), and descending to 3000 feet, but generally ranging from 5000 to 8000 feet. It descends to 4000 feet in Ceylon, and it was collected between 4000 and 5000 feet in Moulmein. The habitat on Kinabalu is therefore exceptionally low. I have seen, however, a specimen from the Ulu (upper) Batang Padang River, in the Malay Peninsula, stated to have been collected at 400 feet. If this indication of altitude is correct—it might be a slip for 4000 feet—it would suggest an extraordinary indifference of this species for climatic conditions. But, as the Batang Padang River drains from a mountain-range rising to 5000 and 6000 feet in altitude, the specimens collected at 400 feet may have been stray individuals carried down accidentally from the subtropical or temperate zone of the mountains. This capability of coping with almost any conditions of climate, except over-dryness, explains sufficiently the intrusion of this Boreal type into the Malayan flora. *Phlomis rugosa* differs comparatively more from its Central-Asiatic and Mediterranean congeners, and it does not ascend anywhere much into the temperate zone, being confined to the tropical or subtropical zones. Its Boreal origin is nevertheless as certain as conclusions regarding the origin of a species drawn from the present distribution of the congeners can be.

3. *Austral-Antarctic Elements.*

I include in this class 16 species which are more or less closely related to elements inhabiting the subtropical and temperate parts of Australia and New Zealand. Most of

them extend at the same time to the Antarctic region, and through it to temperate South America and the Andine region. They may be classified into 3 groups:—

a. *Angiospermous Elements extending across the Antarctic Region.*

Drimys piperita.
Myrtus flavida.
Coprosma crassicaulis.
C. Hookeri.
Nertera depressa.
Pratia borneensis.
Gaultheria borneensis.

Drimys piperita seems to be very characteristic of the ridge-vegetation of Borneo and of East Malaya, and it is also known from the Philippines. The genus is represented by several species in New Caledonia, Australia, and New Zealand, and by some—though opinions vary much as to their number—in America, where it ranges from the extreme south along the Andes to Mexico. The nearest allies in Australia grow in humid forests up to a considerable elevation, and most—if not all—of the remaining species are distinctly hygrophilous. *Coprosma crassicaulis* and *C. Hookeri* are closely allied to certain species from New Zealand and South-east Australia, all of them being most decidedly hygrophilous. This genus as defined at present does not extend to South America, though one species is known from Juan Fernandez and another from the Antarctic Islands south of New Zealand. It is replaced in South America by the genus *Nertera*, which differs from *Coprosma* only in the mode of growth. *Nertera* extends also over the Antarctic region and Australia and New Zealand to the Malay Archipelago, and the commonest species, *N. depressa*, is amongst the Kinabalu plants. It is also typically hygrophilous. *Pratia borneensis* is a close congener of *P.* (§ *Colensoa*) *physaloides*, Hemsl., a herb growing in shady woods in the subtropical parts of New Zealand, the two species forming together a very natural section of the genus. This section does not extend to America, but another section, *Eu-Pratia*, numbers several species in Extra-tropical South America, whilst the remainder is confined to New Zealand and Malaya, except one species peculiar to Malaya and the mainland of Asia as far as the Himalaya and South China. A third section, *Speirema*, is distributed (in a single species) from Malaya to the Himalayan region. All these species are, so far as I could ascertain, hygrophilous, the small species of § *Eu-Pratia* growing in wet soil, particularly along rivers and streamlets, and § *Speirema* in shady and humid forests. One of the little species of § *Eu-Pratia*, the Indo-Malayan *P. begoniæfolia*, occurs also occasionally as a weed in cultivation, and I infer the same for *P.* (§ *Speirema*) *montana* from a note on a label attached to a specimen of it. *Gaultheria borneensis* approaches closely to *G. antipoda*, a species inhabiting the mountains of Tasmania and very common in New Zealand, where it descends sometimes to the sea-shore. Several more species are known from Australia and New Zealand, a few from the Indo-Malayan region, and there is the great bulk of the genus spread over America from the extreme south to Oregon, but not one of the Indo-Malayan species is by any means so closely allied to *G. borneensis* as is *G. antipoda.* Although not dependent on perpetually moist soil or on the shady shelter of woods, *G. antipoda* might yet be considered in a certain sense as a

hygrophilous plant, like so many Gaultherieæ dependent on the frequent saturation of the atmosphere with moisture; and the same is evidently the case with *G. borneensis*, the anatomical structure of the leaves of which is almost identical with that of *G. antipoda*.

b. *Angiospermous Elements not extending to the Antarctic Region.*

Leptospermum recurvum.	*Leucopogon malayanus.*
L. javanicum.	*L. suaveolens.*

Leptospermum numbers 3 species in Malaya. They are very closely related to each other and to *L. flavescens*, Sm., of Australia (in the sense of the 'Flora Australiensis'); in fact, more closely than the extreme forms referred to *L. flavescens* by Bentham. They range on the mainland as far as Moulmein, and they seem to be confined to the drier summits of the mountains. On the other hand, there are at least 20 species in Australia and Tasmania, most of them being found in East Australia, besides several species in New Caledonia, and 2 in New Zealand. They are closely allied and generally not high-level plants, like their Malayan congeners. Some of them grow in moist localities, others along rivers; but, taken as a whole, the genus appears rather adapted to a drier and, above all, sunnier climate. *Leucopogon* is in a similar position. There are also 3 species in Malaya, whilst not less than 118 species are enumerated in the 'Flora Australiensis.' A few occur also in New Caledonia and 2 in New Zealand. If we, however, follow Sir Ferdinand von Mueller and sink *Leucopogon* in *Styphelia*, the number of Australian species would still more increase and the area extend to the Sandwich Islands. The fact that more than 80 species are found in West Australia suggests still more a particular adaptation to a dry and sunny climate than in the case of *Leptospermum*. This would explain why, for instance, *Leucopogon malayanus* prefers open, airy, and light places on the ridges and summits of mountains, but grows also in the low and dry plains of the Island of Phukok. Something similar is the case with *Leucopogon lancifolius*, Hook. fil., which seems to thrive equally well in certain sandy plains on the coast of North Borneo and on the ridge of the main range of Kinabalu, whilst *L. javanicus* and *L. suaveolens* inhabit exclusively the highest parts of the mountains.

c. *Gymnosperms.*

I prefer, for several reasons, to treat the Gymnosperms separately. They are generally the oldest portion of the phanerogamic vegetation so far as geological evidence goes. They play numerically a far more prominent part in the flora of Kinabalu—and in the flora of the high mountains of Malaya generally—than any other group of the Austral-Antarctic elements, and at the same time a different part. They exhibit a very marked habit of growing gregariously, and *Podocarpus cupressina* appears to be the commonest tree of the upper zone of Kinabalu, as it often is in Java at similar elevations. They are, physiognomically and biologically, a well-characterized group, and their distribution does not quite follow the type either of set *a* or of set *b*, though they are most distinctly members of the Austral Conifer flora. There are 2 species of *Podocarpus*, 2 species of *Dacrydium*, and 1 species of *Phyllocladus*.

Podocarpus (§ *Eu-Podocarpus*) *bracteata* has a very wide distribution, from Malaya northwards to the Himalaya and to Japan. De Boer indicates it also from Amboina. Its vertical range is also very wide, extending in the Archipelago from the sea-shore up to elevations of 8000 to 9000 feet, and to 12000 feet in the variety *brevifolia*. It is *very* closely allied to some other Malayan species, and in a lesser degree to *P. elata*, R. Br., from East Australia, and to *P. affinis*, Seem., from the Fiji Islands. These species link it more or less to the remainder of the subgenus, which is spread from New Caledonia to the South Island of New Zealand, to Tasmania and West Australia, from temperate South America to the West Indies, and in a few species from the Cape to Abyssinia and the Camaroons. *Podocarpus* (§ *Dacrycarpus*) *cupressina* is one of the most characteristic trees of the upper mountain zone of the Malay Archipelago. It extends to Mt. Arfak in New Guinea, to the Philippines, and to Upper Burma. There are two or three closely allied species in New Caledonia, and one, very common, in New Zealand as far as Stewart Island. There is no species of this section known from Australia, but a leaf-and-fruit-bearing branch of a fossil specimen, described and figured by Baron von Ettingshausen as *Podocarpus præcupressina* from Vegetable Creek in New South Wales, seems really to belong to this section. *Dacrydium elatum* is, beside *D. Beccarii*, which I know but from Parlatore's description, the only species of *Dacrydium* reported from Malaya. It is represented by a very closely allied, if not identical form, in the Fiji Islands, and approaches very much to *D. cupressina* from New Zealand, where the genus numbers 7 species. Four species are endemic in New Caledonia, 1 in the Blue Mountains of Australia, 1 in Tasmania, and 1 in South Chili. The other species of *Dacrydium* found on Kinabalu is still doubtful. *Phyllocladus hypophylla* is a tree or a shrub, extending from Sarawak to Eastern New Guinea, and, apparently, common near the ridges and summits of the mountains. Another species is found in Tasmania, and a third in New Zealand. The genus seems, however, to have extended in the Tertiary period to South-east Australia, as certain fossils described by Baron von Ettingshausen evidently belong to it. On the other hand, it should be noted that *Phyllocladus* is the only member of the tribe Taxeæ, Eichl., which is Austral, all the other genera being confined to the northern hemisphere.

C. Flora of the Bogs and Rocks.

The luxuriant forest-vegetation which, with the exception of the granite cap, covers the highland of Kinabalu is interrupted in a few places where water collects, thereby—probably in combination with certain conditions of the subsoil—favouring the formation of bogs, and some rocky precipices whose flora I do not at all know. The principal gap, however, is caused by the granite cap itself, which excludes almost all vegetation except on the top and on the less precipitous southern side above the main range. This scanty vegetation of the granite cap is all we know of the rock flora of Kinabalu, and to it my remarks refer exclusively so far as they concern the flora of the rocks. These bogs and rocks are almost isolated from the surrounding forest-vegetation by the very conditions to which they owe the presence of a flora of their own,

and they are at the same time open to a great number of plants from almost any quarter, provided that they comply with the special conditions of plant-life afforded by them. These conditions, however, are—particularly in the case of bogs—far more universal than those of the forest. Yet the absence of competition from the side of the forest-vegetation must have another effect,—the preservation of remnants of old and retreating or already more or less extinct floras, a phenomenon so frequently met with in the bogs of the Tropics, as well as of the temperate regions. The position of the rocks is somewhat modified, as their chemical and physical properties and the modes of water-supply are more varied, and the conditions of plant-life, therefore, in every particular case more specific. Still they represent the driest, airiest, and sunniest portion of Kinabalu. They are exposed, more than any other part of the mountain, to powerful insolation in the mornings, and to strong radiation during the nights, thus affording some chance to elements of less equable, sunnier, and drier climes. That they are still so poor in variety and quantity may be mainly accounted for by the nature of the granite, which is generally unfavourable to luxuriant vegetation, and must be specially so here, as the steepness of the slopes does not allow any accumulation of detritus, except in a few hollows and crevices. The more universal character of the conditions of plant-life, and the absence of any active competition on these bogs and rocks, make it intelligible that we find present in these formations plants which often or generally belong to different formations in other regions, thus rendering the formations of the bogs and rocks much less homogeneous than the forest. In fact, about one-half or even more of the bog flora consists of elements which are not typical bog plants, *i. e.* plants which are dependent on the particular physical conditions of bogs, and there is perhaps not a single species among those of the rock flora which might be called a typical rock plant. There are a few plants in this flora which belong to types which generally participate in the formation of the tropical or subtropical forest, and might be considered as elements originating from this formation and specially adapted to the conditions peculiar to life on rocks. But more than 90 per cent. of the flora of the bogs and rocks are perfectly foreign to the forest-vegetation. Some of these are Cosmopolitan, some typically Boreal or Circumpacific; but about one-half is closely related to Austral-Antarctic elements. Amongst these we may distinguish two groups with regard to their broader affinities—one group comprising species which, though closely allied to Austral-Antarctic forms, yet belong to Boreal types, and another group which, looked at from the same point of view, appears still exclusively Austral-Antarctic. We thus deduce the following classes and subclasses.

1. *Cosmopolitan Types.*

Cosmopolitan types are *Drosera spathulata, Utricularia orbiculata, Eriocaulon Hookerianum*, and *Scirpus inundatus.* They are as *species* not so universally distributed, but are so closely allied to species scattered almost over the whole world that they have representatives in almost every one of the great subdivisions of the earth with the exception of the Polar region.

2. *Boreal Types.*

a. *Boreal Elements.*—This subclass comprises those species which are intimately connected with Boreal species, namely :—

Potentilla leuconota.	*Carex rara.*
P. Mooniana.	*Agrostis canina.*
P. parvula.	*Deschampsia flexuosa.*
Gentiana borneensis.	*Deyeuxia epileuca ?*
G. lycopodioides.	

Four out of these 9 species are endemic, but one of them, *Potentilla parvula*, may be perhaps only a state of *P. Mooniana* (see p. 147). The affinity of the potentillas and gentians is so clear that I need not here discuss it. These types are known from the Owen Stanley Range, but they do not extend farther south or east. *Carex rara*, however, ranges as far south as New South Wales, but it is a member of a group of hardly separable species which is nearly confined to Japan, China, and North-east India. *Agrostis* and *Deschampsia* are essentially Boreal genera, and the varieties of *A. canina* and *D. flexuosa* found on Kinabalu are, like those from New Zealand, Australia, or South America, only subordinate branches of Boreal types. *Deyeuxia epileuca* shows perhaps more relations with some Australian species, but I am still doubtful as to the true systematic position of this plant. *Potentilla Mooniana*, the 2 species of *Gentiana*, and *Carex rara* grow on Kinabalu in more or less boggy places. The same *Potentilla* and the representative species of *Gentiana* of the Himalaya, however, are rather meadow plants than anything else, though the gentians seem to prefer or withstand a greater amount of moisture. *Potentilla leuconota*, *Agrostis canina*, and *Deschampsia flexuosa* are also meadow plants, the grasses generally growing gregariously, but on Kinabalu they have become rock plants, nestling in crevices and holes of the rocks.

b. *Elements representing Indo-Malayan Branches of Boreal Types.*—This subclass comprises :

Aletris foliolosa.	*Carex filicina.*
A. rigida.	*C. hypsophila.*
Scirpus Clarkei.	*C. fusiformis.*

The two species of *Aletris* form a small and very natural set which is limited to Malaya, but they may be traced back to the more numerous forms which inhabit East Asia from the temperate Himalaya to Japan, whilst another species is widely distributed through the Eastern States of North America. The genus is a perfectly isolated type; most of the species inhabit boggy or marshy places. *Scirpus Clarkei* is very closely allied to *S. subcapitatus*, Thw., a species ranging from Ceylon to China, both forming a distinct group of their own. *Carex filicina* is a member of the great group "*Indicæ*," and particularly of a set which abounds in India and is plentiful in China and Malaya *Carex hypsophila* and *C. fusiformis* belong to a group of closely allied species,

extending from India through China to Japan. All these elements, however, may be traced back to types of an essentially Boreal character. *Carex filicina* and *C. hypsophila* are known from Malaya proper, but *C. fusiformis* has hitherto been found in the Himalaya only, between 7000 and 12,000 feet. All these species are distinctly hygrophilous.

c. *Elements representing Austral-Antarctic Branches of Boreal Types.*—These are most distinctly related to Austral-Antarctic species, but there is a very remarkable gap if they are compared with their Boreal congeners. I refer 3 species to this subclass :

Ranunculus Lowii.
Havilandia borneensis.
Euphrasia borneensis.

Ranunculus Lowii is connected with the Australian group of *R. lappaceus* through *R. amerophyllus* from the Owen Stanley Range in New Guinea, but there is no close congener among the Ranunculi of Asia, Europe, or North America, so far as I am aware. *Havilandia* is an endemic genus, but distinctly allied to that branch of *Myosotis* which is represented by the Austral-Antarctic *M. australis*. On the other hand, it approaches somewhat to *Trigonotis*, a genus ranging from North China, Central Asia, and Japan to New Guinea. *Euphrasia borneensis* is in exactly the same position as *Ranunculus Lowii*. None of the 3 species is distinctly hygrophilous, nor are their congeners, although some of them are at least indifferent to a surplus of water in the soil.

3. *Austral-Antarctic Types.*

Haloragis micrantha.
Trachymene saniculæfolia.
Drapetes ericoides.
Patersonia Lowii.
P. borneensis.
Cladium borneense.
C. samoense.
Schœnus apogon.
S. melanostachyus.

Haloragis and *Drapetes* extend across the Antarctic region to South America. *Trachymene* is represented by one species in New Caledonia and by numerous species in Australia, but a few allied genera extend from Patagonia along the Andes beyond the Equator. *Patersonia* is also limited to Australia, but it has representative genera in *Solemanthus* and *Chamelum* in Chile. *Cladium borneense* belongs to the large group of *Baumea*, which inhabits Australia, New Zealand, and the islands of the Old World between 0° and 45° S. lat. from Madagascar to the Sandwich Islands, 3 species only running up to China and Bengal. *Cladium samoense* is a member of the section *Vincentia*, which is almost exclusively found between 0° and 45° S. lat. in the islands from Madagascar to the Sandwich group and Juan Fernandez. The genus *Schœnus* is, with very few exceptions, confined to Australia, New Zealand, and the neighbouring islands, but *S. apogon* is one of these exceptions, being limited to Malaya. *Haloragis* seems to depend on a certain amount of moisture, though the soil may be stony or sandy. *Trachymene* grows most luxuriantly in wet soil, and in a dwarfed but apparently vigorous form in crevices of rocks on Kinabalu. The allied Australian species seem to be equally indifferent, and it is in no case a characteristic bog plant. Of the nature of the habitats of the Australian species of *Patersonia* we know very little, but *P. glauca*, which is

closely allied to the Kinabalu species, grows in wet and peaty soil in Tasmania, whilst others live on sandy ground in generally dry parts of Australia. *Schœnus* is another of those very flexible types which are neither typically hygrophilous nor typically xerophilous, but capable of associating with plants of either kind. *Drapetes* grows, so far as I can ascertain, everywhere in open land, evidently depending upon a greater amount of light, but at the same time of moisture.

VI. THE HIGHLAND FLORA OF KINABALU COMPARED WITH THAT OF NEW GUINEA.

I have already alluded to the analogies in the character of the vegetation of the higher parts of the Javan mountains and of the highland of Kinabalu, analogies which find their expression not only in the physiognomy, but also in the systematic composition of the flora. It would be of very great interest to compare the flora of Kinabalu also with the floras of the high mountains of Celebes, Palawan, Mindanao, and Luzon, some of which rise to 9000 and even 10,000 feet. Unfortunately we know next to nothing about them. On the other hand, Beccari's expedition to Mt. Arfak, Macgregor's exploration of the Owen Stanley Range, and Zoeller's visit to the Finisterre Mountains have brought to light facts which are of great importance for the understanding of the flora of Kinabalu.

One cannot read the few lines which Beccari has written on the summit flora of Mt. Arfak ('Malesia,' i. p. 215) without being reminded of some of the most characteristic elements of the ridge-vegetation of Kinabalu. *Podocarpus cupressina*, *P. Rumphii*—which Beccari considers identical with *P. bracteata* in another place—species of *Æschynanthus*, *Dichrotrichum*, *Balanophora*, *Pratia*, *Eurya*, *Drymis*, *Leptospermum*, *Myrica*, and 7 Ericaceæ are amongst the plants which his small list of the summit flora contains. The physiognomic character of the vegetation of the higher part, and particularly of the ridges of the Finisterre Mountains as we know it from Zoeller's description and from Warburg's paper "Bergpflanzen aus Kaiser Wilhelm's Land" [in Engler, Bot. Jahrb. xvi. p. i. pp. 1–32], seems to be very similar to that on Kinabalu. The small collection, however, which Hellwig brought home from this expedition contains few identical genera if compared with the Kinabalu collections; yet there are among them not less than 5 species of *Rhododendron*. The highest interest attaches, however, to the Owen Stanley Range. Dense forest covers the slopes of this mountain up to 11,500 and locally to almost 11,900 feet, followed by a zone characterized by an almost purely herbaceous vegetation of "alpine" character, but still of a poor aspect. Here, as on Kinabalu, a zone of extreme moisture lies between 7000 and 8000 or 8500 feet. "Everything is draped in moss, which gives the forest a soft and lonely aspect; and at that time all objects were saturated with moisture." (Macgregor, Journ. Geogr. Soc. 1890, p. 204.) "Roots, trunks and branches were wrapped up in thick coverings of moss; even the leaves were not free from it. Everything was soaking wet." (Macgregor, l. c. 208.) But this "zone of moss and fog" is followed here by a zone with a "dry and fine climate," as is the case in the high mountains of Java. This is very different from what we find on Kinabalu, where the granite cap receives an enormous amount of rain even during the driest month.

The following is a list of the plants collected by Macgregor's Expedition, taken from Sir Ferdinand von Mueller's paper [Trans. Royal Soc. Victoria, i. part ii. 1–45], compared with the corresponding types from Kinabalu. I may remind the reader that Sir F. von Mueller's paper deals exclusively with the plants collected above 8000 feet.

Macgregor's Collection.	Kinabalu Collections.
Ranunculus amerophyllus.	*Ranunculus Lowii.* ~ *
Drimys piperita.	*Drimys piperita.*
D. hamatensis.	*D. piperita.* ~
Hypericum Macgregori.	
Elæocarpus latescens.	*Elæocarpus sericea.*
Sagina donatioides.	
Drapetes ericoides.	*Drapetes ericoides.*
Rubus Macgregori.	
R. diclinis.	*Rubus Lowii.* ~
Potentilla leuconota.	*Potentilla leuconota.*
Metrosideros Regelii.	
Epilobium pedunculare.	
Helicia Cameronii.	*Helicia erratica.*
Galium javanicum.	
Mikania scandens?	(*Mikania scandens,* a weed of the hill zone.)
Anaphalis Mariæ.	
Aster (§ *Olearia*) *Kernotii.*	
Vittadinia Alinæ.	
V. macra.	
Myriactis bellidiformis.	
Lagenophora Billardieri.	
Ischnea elachoglossa.	
Senecio haplogynus.	
S. erichthioides.	
Taraxacum officinale.	
Vaccinium acutissimum. *V. Helenæ.* *V. Macbainii.* *V. amplifolium.* *V. ambyandrum.* *V. parvulifolium.*	10 species, all of the section *Epigynum.*
Gaultiera mundula (*Diplycosia*).	12 species of the genus *Diplycosia.*
Rhododendron gracilentum.	*Rhododendron ericoides.* ~ †
R. Lowii.	*R. Lowii.*
R. phæochitum.	*R. rugosum.* ~ †
R. spondylophyllum.	*R. verticillatum.* ~ †
R. culminiculum.	
Styphelia montana (*Leucopogon*).	*Leucopogon,* 3 species. ~

* The sign ~ signifies that the Kinabalu species approaches *closely* to the New Guinea species.

† According to Sir Ferdinand von Mueller.

Decatoca Spenceri.	
Gentiana Ettingshausenii.	*Gentiana lycopodioides.* ~
Alyxia semipallescens.	*Alyxia lucida* and another species.
Veronica Lendenfeldii.	
Euphrasia Brownii.	*Euphrasia borneensis.* ~
Trigonotis Haakei. *T. inoblita.* *Myosotis australis.*	*Havilandia borneensis.*
Phyllocladus hypophylla.	*Phyllocladus hypophylla.*
Libocedrus (?) *papuana.*	
Dendrobium psychrophyllum.	*Dendrobium,* 2 species.
Sisyrhinchium pulchellum.	*Patersonia,* 2 species.
Korthalsia Zippelii (above 8000 ft. ?).	1 species, in the hill zone, figured by Burbidge.
Astelia alpina.	
Carpha alpina.	
Scirpus cæspitosus.	Several species.
Gahnia javanica.	
Schœnus curvulus.	2 species.
Carex fissilis.	Several species, but of other groups.
Uncinia riparia.	
U. Hookeri.	
Agrostis montana.	*Agrostis canina.*
Aira cæspitosa.	*Deschampsia flexuosa.*
Danthonia paniculata.	
Festuca ovina.	
F. pusilla.	
Lycopodium clavatum.	*Lycopodium clavatum.*
L. Selago.	*L. Selago.*
L. scariosum.	*L. Wightianum.* ~
L. volubile.	*L. volubile.*
Gleichenia dicarpa.	1 species.
G. flagellaris.	
Schizæa dichotoma.	1 species.
Hymenophyllum tunbridgense.	2 species.
Cyathea Macgregori.	*Cyathea polypoda* and *C. Havilandii.*
Polypodium punctatum. *P. trichopodum.*	5 species.
Aspidium aculeatum.	
Tænitis blechnoides (*Polypodium*).	*Polypodium blechnoides.*
Vittaria elongata.	*Vittaria sulcata.*

There are only six phanerogams in Mueller's list which are also found on Kinabalu; but 22 species, or more than one-third, are represented by rather closely allied forms, whilst 9 others are more remotely, but still distinctly related. More than one-half of these representative species belong to old Indo-Malayan or Circumpacific types, a few are typically Boreal, and about 10 are Austral-Antarctic elements. At least 6 of the latter represent, however, Austral-Antarctic branches of Boreal types. Thus it will be seen that

the affinity of the floras of Kinabalu and of the Owen Stanley Range rests mainly on the presence of certain—and numerous—Ericaceæ and of a number of Austral-Antarctic forms which, however, are mostly Boreal in a wider sense. That the Austral-Antarctic element is so much richer on the Owen Stanley Range is only what we might expect from the geographical position of these mountains. The absence of composites in the highland flora of Kinabalu, whilst they are so numerous on the Owen Stanley Range, is remarkable; but most of the composites in Sir Ferdinand von Mueller's list seem to belong to Austral-Antarctic types, only *Taraxacum officinale, Myriactis bellidiformis*, and perhaps *Anaphalis Mariæ* being Boreal.

VII. MEANS OF DISPERSION AND DISTRIBUTION.

I have already pointed to the large proportion of plants producing fleshy fruits in the flora of Kinabalu. It amounts to 35–40 per cent., whilst those the fruits or seeds of which are apparently adapted by their smallness or certain contrivances for dispersion by wind partake with 25 to 28 per cent. I have alluded to the prominent share of the endemic element in both classes as a strong reason against the assumption that these "means of dispersion" might *generally* account for the wider or more limited distribution of species. I wish to dwell on this point more especially in this place.

The following table shows the comparative share of those two classes and of the remainder, consisting of plants having no particular means of distribution, in the flora of the three principal formations. The three columns to the right are added to show the proportion of the endemic element in each of these classes and formations. S stands for plants possessing fleshy fruits (*sarcocarpous* plants); C for plants having very minute seeds, like dust (*coniospermous* plants); P for plants having fruits or seeds provided with some flying contrivance (*pterocarpous* plants); and 0 for plants having no particular means of dispersion. C and P are represented by a single column, as both are generally looked at as special adaptations for dispersion by wind, and as the plants referable to P are so very few.

Formations.	Percentage calculated from total Vegetation.			Percentage of Endemic Species.		
	S.	C, P.	0.	S.	C, P.	0.
Secondary forest (hill zone)	46·5	18·6	32·5	15	....	36
Primary forest (2nd zone)..........	45	29	26	53	70	46
" " (3rd zone)............	50	32	18	70	70	70
" " (4th zone)............	59	30	11	75	75	66
Bogs and rocks	....	26	74	....	37·5	24

A glance at this table shows the very different character of each of the three principal formations. The secondary forest of the hill zone approaches the primary forest of the second zone, so far as the figures in the first three columns are concerned, the difference

in class C, P being mainly due to the increase of coniospermous Melastomaceæ, of species of *Rhododendron* and of Orchideæ towards the upper limit of the second zone. It differs, however, extremely, so far as the last three columns are concerned. They show not only, as I have already pointed out, that the flora of the secondary forest is much more universal and that of the primary forest more individualized, even in the lower zone (see p. 91), but also that the increase of the endemic element takes place mainly among those plants which are apparently best fitted for dispersion. This difference still increases if we take the third or the fourth zone into consideration. I believe this phenomenon is not difficult to explain.

The land at the foot of the mountain is of comparatively recent formation. It has been subjected to the process of clearing to a very great extent and probably for a very long time. It shares these peculiarities, and at the same time the general and physical conditions of plant-life, with the greater portion of Borneo and with many parts of the Archipelago. This process of clearing must have shaken the balance of the aboriginal vegetation, weakening it by the alteration of the conditions of plant-life, and at the same time opening the way for new competition. The invasion of this new element was, no doubt, favoured by the circumstance that the birds and mammals which might be the active means of plant-dispersion in this part of the country are commonly species of wider distribution, and many of them range freely. Wind must have been also more efficient—as a spreading agency—on the cleared land than on the forest-clad highland, and finally man himself certainly often became voluntarily or inadvertently the cause of dispersion. All this is very different from what we find in the primary forest, as we ascend the mountain. Here the land is geologically old land. We have no evidence that its vegetation was ever disturbed to any great extent by clearings. The physical conditions of plant-life have no longer the same more universal character as in the hill zone; they deviate decidedly and become gradually more peculiar. The vegetative aspect as well as the systematic composition of the primary forest, both the result of a long struggle under these very conditions, assume a similarly individualized character. The forest forms a harmonious union of congenial elements. Each of them is adapted in its way to the nature of the climate and of the soil, and all are in a state of comparative equilibrium which will not cease or materially change so long as the conditions out of which it has grown continue to exist. The animal kingdom undergoes a similar change as the elevation increases, the endemic species becoming proportionally more numerous. Whitehead mentions migratory birds from the coast region of North Borneo as well as of Palawan, but not from the highland. True, some birds were found there which are exactly identical with species known from the Himalaya, but they are not migratory. The fact remains, so far as I can see, that most of the mammals and birds of the higher zones—if not all—are confined to the highland, and never leave it. Wind may exercise its full power on the ridges, but not in the high forest which clothes the slopes and the bottoms of the valleys, and it can hardly at all affect the ground vegetation, which comprises most of the coniospermous Melastomaceæ, Begoniaceæ, and a part of Orchideæ. It might carry the extremely light seeds of *Rhododendron* or *Nepenthes*, which grow mainly on the ridges, a great distance. In any case, it has not been very

successful in widening their areas, as more than two-thirds of the species of these genera, found on Kinabalu, are endemic on the mountain. The orchids are in a similar position, only two species out of twelve which were collected on the ridge of the main range being non-endemic. Thus almost every circumstance seems to be in favour of stability and individuality, and contrary to change and exchange. This apparently explains sufficiently the extreme endemism of the highland flora of Kinabalu, but it does not render the prevalence of sarcocarpous and the great number of coniospermous plants more intelligible. It is, *a priori*, highly improbable that the production of berries or of dust-like seeds should not play some prominent part in the life-history of these plants, or, as we put it teleologically, not have a distinct design. It is obvious that any contrivance which favours the dispersion of seeds and thereby prevents the accumulation of seedlings within reach of the mother-plant is *eo ipso* an advantage to the species, and it is at the same time a well-established fact that these contrivances have in numerous cases the desired effect, if I may say so. But this does not necessarily involve dispersion over *wide* areas, and particularly dispersion over areas which are separated by sea or by regions of more or less different physical characters. No doubt, dispersion of this kind takes place amid favouring circumstances, but it implies the existence of some appropriate *active* means of spreading, be it wind, or birds or some other animals, and its success always depends on the presence of conditions favourable to the final settling of the species in the new home. Thus the problem is actually very complex, much more so, indeed, than often is admitted in speculations on the distribution and migration of plants. I myself have no doubt that the presence of many widely distributed elements in the secondary vegetation of the hill zone is partly due to the development of particular "means of dispersion," as berries, very minute seeds, or flying contrivances, and that it might be brought about even under such conditions as now exist. This cannot be said with regard to the flora of the primary forest, however favourable the frequent presence of berries or of dust-like seeds may have been to wide dispersion under different conditions.

The third column from the left (in the table on p. 110) contains the figures representing the element that does not possess any particular means of dispersion. The figures are probably too high, as some of the plants referred to this class may possess some contrivance which acts as a passive means of dispersion without our knowing it or being able to know it unless by means of observation on the spot. The fruits and seeds of others might, although actually not adapted in any way to a particular mode of dispersion, be scattered about accidentally. Yet the normal way of widening or shifting their area would always be by spreading slowly—so to say, inch by inch or foot by foot. True, very vigorous and flexible or plastic types of this kind might—like any others—thus push on a considerable distance even in the absence of any powerful impulse from without; but this is certainly quite exceptional, and we may safely say that the present distribution of this element is still more unintelligible under the present conditions than the distribution of the plants of class S or class C and P. The flora of the bogs and rocks, subjected to a similar examination, leads to the same result, although it differs considerably from the forest flora so far as the proportional share of the three biological classes now under consideration is concerned. There are no sarcocarpous

plants of any kind among them, whilst the coniospermous element consists of 37·5 per cent., leaving thus almost two thirds of the bog and rock plants without any particular "means of dispersion." Among the coniospermous bog plants, *Drosera*, *Utricularia*, and *Eriocaulon* are types rather indifferent to temperature. They would—and certainly do—succeed in settling in any boggy or generally wet spot between the highest point where they were collected and the coast. There is, in the coast region, certainly ample opportunity for their spreading over wide areas by wind or by birds, even under the present conditions. Birds are sometimes, as we know from well-established facts, a very efficient agency so far as the dispersion of bog, marsh, or swamp plants is concerned, the seeds easily sticking with mud to their legs or clinging to their plumage. In a similar position are most sedges—or perhaps all with the exception of *Carex fusiformis* and *C. hypsophila*, which seem to be true high-level plants, and probably also *Haloragis micrantha*. If we deduct all these plants there remain still about 20 species, belonging either to the rock or bog formation, for the dispersion of which we cannot account by merely referring to the general conditions as they at present exist. Four or five of them are coniospermous, but among them is only one non-endemic species (*Aletris foliolosa*). The rest have small seeds or fruits, but certainly not small or light enough to be carried a considerable distance by wind. These fruits or seeds may, of course, be occasionally scattered by birds or mammals, by water or landslips, &c., but there is, to my knowledge, no agency whatever operating on Kinabalu to bring about in this way an exchange with those regions where these species or their nearest congeners are found.

VIII. SUGGESTIONS ON THE HISTORY OF THE FLORA OF KINABALU.

I hope to have shown in the preceding section that the composition of the flora of Kinabalu points most emphatically to a time when the conditions of plant-dispersion were very different from what they are now. The principal circumstances which prevent the exchange of the primary highland flora of Kinabalu with other floras at present are the absence of birds or mammals, which might be the active means of the exchange, and the isolation of the highland. But, as the absence of such animals itself is evidently a consequence of this isolation, we are forced to the conclusion that there must have been a time when this isolation of Mount Kinabalu did not exist. There are two kinds of changes which might put an end to the isolation of the mountain and its flora. One is a great climatic change such as would compel the highland flora to descend into the hill zone and the plains. It would account for very much; yet there is no evidence that anything of this kind ever has occurred, although a *slight* depression of the lines of vegetation of many plants may have taken place. The other change is in the distribution of land and water. If Kinabalu once was in immediate connection with the highland of New Guinea, or what was then its equivalent, the presence of many of the Austral-Antarctic types in the Kinabalu flora would become intelligible. A similar connection with continental Eastern Asia would account for the Boreal and Circumpacific types, and a union of the Malayan islands for the preponderance of the Indo-Malayan element. A negative shifting of the shore-line to the extent of

600 or 700 feet would be sufficient to join Borneo to the mainland, to Sumatra and Java, and to the Philippines, and it would bring Celebes in reach within a few miles. Celebes itself would extend far enough to include Buru, and thus be brought very close to Ceram and New Guinea. A shifting of 1600 to 1700 feet, however, would complete the union of Borneo with Austro-Malaya, including New Guinea, and with Australia (see Berghaus, 'Physik. Atlas,' no. 25). Yet I doubt whether such a change by itself would be sufficient to cause a considerable exchange of the *highland* floras concerned. It would raise some of the lower spurs and ranges, with which the highland of Kinabalu is at present connected at low levels, to such altitudes that they might exchange a part of their present flora with a flora more like the one living now on Kinabalu in similar altitudes. Something of this kind would happen in Sumatra or in any other part of the united land, and, no doubt, the various highlands would be brought closer together. A simultaneous depression of the lines of vegetation such as might have occurred, for instance, during a period of extreme glaciation, without seriously impairing the tropical vegetation of the lowland, would have favoured the exchange still more. There would, however, still have been wide lowlands having a tropical climate and a tropical flora where there is now sea, and these lowlands would have been almost as strong a barrier for the *highland* flora as the sea is now. But such a state is hardly conceivable without some simultaneous change in the surface of the land. The denudation which takes place in the highland before our eyes is enormous. Its configuration and that of the surrounding land show clearly enough that it has been going on at this rate for a long time. Then the highland must once have been far more extensive, if not also higher. It most probably shared this denudation with the remainder of the Bornean highlands, the detritus of which is deposited in the vast Tertiary strata which cover one half or more of Borneo. Other highlands beside this have very likely existed in the former Malayan continent, and, in connection with them, highlands which made the invasion of a northern and of a southern element of more or less temperate character possible. In fact, the assumption of such highlands seems to me the *conditio sine quâ non* for understanding the history of the flora of Kinabalu and of the highland flora of Malaya generally.

A more exact determination of the lines over which, and of the time when, the exchange took place is hardly possible at present. It could be undertaken only on the basis of a comparative study of the entire highland flora of the Malay Archipelago and of a more complete knowledge of the geology of the region. I restrict myself, therefore, to a few general remarks referring to this question.

Beccari ('Malesia,' i. pp. 219, 220) was of opinion that the Boreal alpine element on the high volcanoes of Java must have immigrated at a very recent date, as the volcanoes themselves are so very recent. Their habitats on these volcanoes are, of course, as recent as or more recent than the volcanoes. But this does not necessarily imply that they did not already exist in this part of Malaya before the volcanoes were thrown up. We know that the Javan volcanoes rest upon Tertiary strata, and traces of the old Schistose Formation which occupies so much space in Sumatra were discovered only some ten years ago. The recent volcanoes of Sumatra, on the other hand, rest upon this Schistose Formation,

and under conditions which prove that the volcanoes broke through a completed, or nearly completed, chain of folded mountains. This old highland may probably have contained a great number of such types, which would have been taken over by the volcanoes as they were thrown up and the highland broke down. That a Boreal element existed in Malaya before the appearance of these volcanoes is clearly demonstrated also by the presence of so many Boreal types in Australia. There is no doubt that most, if not all of them, reached Australia by way of Malaya and Austro-Malaya, and they can have reached Australia, in my opinion, only by way of a land-connection, for—quite apart from other reasons—the majority of these types have no particular "means of dispersion." If so, these types must have existed in Malaya before the eastern portion of the Indo-Malayan region was separated from the western. We do not know exactly when this separation took place or was completed, but it seems to have existed at least since the earlier part of the Tertiary period, or long before the volcanos of Sumatra and Java were built up. This separation fixes also, on the other hand, the time of the invasion of the Austral-Antarctic element. It must have reached Borneo previous to the separation, although it may have spread later northward and westward The next temperate (or subtropical) element consists of the Circumpacific types. Their general distribution suggests that they are very old types. In which part of Eastern Asia they originated I do not venture to speculate. In any case, they, or at least some of them, must have been already in Malaya before it was separated from Austro-Malaya, as their extension into Austro-Malaya proves. Beccari ('Malesia,' i. p. 224) points also to the fact that the line over which the Austral-Antarctic types are distributed in Indo-Malaya lies over New Guinea, the Moluccas, Borneo and Sumatra, while Java has scarcely any. I find that Java is just as rich in these types, or rather just as poor, as Sumatra ; but North Borneo is certainly very much richer than both of them. It might be suggested that the climatic conditions of North Borneo are more like those of the Austral-Antarctic regions. This, however, could hardly apply to the "mist zone" of the Sumatran and Javan mountains, though it might to the summit zone, which seems to be much drier in Java than it is on Kinabalu. Yet, if we remember that the Philippines also possess a very remarkable set of Austral-Antarctic types (see Rolfe, in Journ. Linn. Soc. (Bot.) xxi. p. 296), it seems much more plausible to assume that the main line along which this Austral-Antarctic element moved lay rather over Halmaheira and North Celebes than over or south of the Banda Sea.

Every fact that applies to these three components of the temperate highland flora applies with still greater force to its fourth and last component, the Coniferæ, and to the greater part, if not to the whole, of the intra-tropical flora. Both elements must have ranged over both portions of Indo-Malaya, east and west of the Moluccas, before the separation of Malaya and Austro-Malaya began, and they did so probably a very long time before.

An interesting question arises with regard to those Austral-Antarctic types which I have designated as a branch of Boreal types of higher order, and I might perhaps add to them the varieties of *Agrostis* and *Deschampsia*, and probably also *Deyeuxia*. A remarkable fact is that they are closely connected with southern forms, but slightly with

their northern congeners, although everything seems to point to a Boreal origin. Are they survivals from the great invasion to which the presence of so many Boreal types in Australia and even in the Antarctic region is due, or is their presence on Kinabalu and on the Owen Stanley Range the result of a partial re-migration of Boreal types from the Austral-Antarctic regions? In the latter case the phylogenetic gap in their relations to their northern congeners might be explained by the transformation which the southern branch underwent after having reached the Austral-Antarctic regions. We might, however, just as well admit the other alternative under the perfectly justified assumption that the northern congeners deviated more from their ancestors than the southern ones, which were hardly transformed at all. It has also been suggested (Wallace, 'Island Life,' p. 490) that types of this kind might form the most advanced posts of a migratory movement of an extraordinary extent, namely from North America by way of the Andes to the extreme south of South America, and thence to the Antarctic region, to Australia and New Zealand, and finally to Malaya. Yet the particular types to which I refer in this place do not show a closer affinity to North American forms. They stand in the same abrupt relation to them as to their congeners in temperate Eurasia.

I will now try to summarize briefly the conclusions to which I come with regard to the history of the flora of Kinabalu. The highland of Kinabalu formed, at a period not later than the earliest part of the Tertiary epoch, a portion of a much more extensive highland, which was—simultaneously or in consecutive periods—connected with other highlands which stretched over a wide continental area extending from the south-eastern part of the present mainland of Asia into the Austral-Antarctic regions. The flora of the then highland of Kinabalu contained already all the essential elements which at present characterize it. At the end of this period the highland connection with the south-eastern portion of this continent was severed, so that no important exchange of temperate elements could take place any longer in this direction. Lowland connection may have continued still for a time, after which it also ceased. Up to this point the flora of Kinabalu and of the neighbouring parts of the old continent, east and west of Kinabalu, formed a natural unit, grown up under the influences of a common history, and still manifest in the broader affinities of the present floras of these areas. After the separation of Austro-Malaya a new period in the evolution of the floras east and west of the line of separation began. The differences which were, no doubt, already indicated now became manifest and more accentuated. The highland of Kinabalu was still in close connection with the remainder of Malaya and with the Philippines. Then these broke away, whilst the connection with West Malaya still continued, and under conditions which caused a considerable general uniformity of the flora of Malaya. The pronounced Malayan character of the flora of Kinabalu dates from this period. Then the Malayan land subsided or broke down, leaving an archipelago. These conditions went on and reached a maximum which must have been considerably above the present state. Borneo itself was reduced to a group of islands, of which the highland of Kinabalu was one. The increasing isolation must have acted as a most powerful agent in the evolution of the flora. It could not add any new element to the flora, as it then was, but it gave it that strongly localized or individualized character which still distinguishes

it. Then the shore-line shifted again the other way. The Bornean islands were joined into one. The floras of these islands, advancing with the advancing coast, met, and a fresh exchange took place, which, however, could not materially affect the highland floras, for they were still separated by the lowland. The exchange and the ensuing generalization of the flora remained therefore confined to the lower zones, whilst the highlands maintained their individual character. In still more recent time man became an agent in dispersion and in generalizing the character of the flora. Large parts of the "old jungle" fell by knife and fire, and although the original vegetation generally springs up again and again with apparently unabated vigour, there can be no doubt that many of its feebler elements have already succumbed in this struggle. Others better adapted to the new conditions took their place, and, often favoured by particular means and conditions of dispersion, spread far and wide. A "secondary" vegetation thus replaced the primary or aborginal one, a change in which the hill-zone flora of Kinabalu shared equally with the flora of any part of the lowlands or the hills where man settled.

The last point with which I wish to deal concerns the bearing of the results of the examination of the flora of Kinabalu on the general differentiation of the Indo-Malayan flora. The flora of Kinabalu is a new proof of the essential unity of the Indo-Malayan flora west and east of Kinabalu or the Macassar line. But the flora of the Austro-Malayan division differs at least as much from that of the Malayan division as the latter differs from the flora of the Himalaya region or of Indo-China. True, the relationship of the Malayan and Austro-Malayan floras is very much closer if we take into consideration the floras of the coasts, lowlands, and hills, and they become almost uniform if we confine the comparison to the shore vegetation. Yet this is the least stable portion of the flora, and therefore teaches us almost as little about the history and the affinities of the flora as a comparison of weeds would do. We have therefore to rely on the most conservative portion of the flora, the flora of the primary forest, and particularly of the highland forest. I drew the line between Malaya and Austro-Malaya in accordance with Wallace's Macassar line, chiefly because it almost coincides with the meridian of Kinabalu. If I had included Celebes in Malaya, very few species would have been added to the list of the Malayan elements of the primary flora. It must, however, not be forgotten that very little is yet known of the primary flora of the higher parts of Celebes. This remark applies more or less to Buru, Halmaheira, Ceram, and the other islands west of the line which separates Warburg's "Papuasian" flora from the flora of "Malesia" (Warburg, in Engler, Bot. Jahrb. xiii. (1891) 230 *et seqq.*). It is very probable, for geological reasons, that the line separating the Malayan and the Austro-Malayan floras will be found to lie much nearer to Warburg's line than to Wallace's; but I believe its exact course will appear to be almost as indefinite and practically arbitrary as, for instance, the line which separates the Malayan and the tropical Himalayan floras. There will always be a wider or narrower strip of borderland between the two divisions. Where it consists of recent land, and particularly of land of low elevation and of cleared land, it will bear the more universal character of the insular Indo-Malayan flora; where it comprises primitive and undisturbed land it will naturally be rich in endemic elements, and it will approximate more or less to the typical Malayan or to the typical Austro-Malayan character, according to the position

east or west of the line of geological separation, provided that this line is a definite line. This is evidently not the case. The line along which the old Indo-Malayan continent first broke up into an eastern and a western portion was certainly not a geometrical line, nor was it formed simultaneously in all its parts. The breaking-up of the continent most probably took place over a broad strip of land along different and changing lines, and it was certainly not completed before the lapse of a very long time, nor has the region in question since been in a state of undisturbed stability.

I have purposely stated the facts and drawn the conclusions exclusively from the standpoint of the botanist, referring only secondarily to the geology of the area. The result is essentially the same to which Warburg came, mainly from the examination of the "Papuasian" flora. He has already pointed out, and I agree perfectly with him, that there is nothing in this theory of the evolution of the Indo-Malayan insular flora which is in conflict with the zoo-geographical facts as they are known from Wallace's researches and from the more recent publications on the subject, nor do I find anything in it which contradicts the results of the geological explorations in the area concerned so far as I am acquainted with them.

IX. TABLES SHOWING THE DISTRIBUTION OF THE SPECIES OF EACH OF THE FOUR ZONES.

(See also p. 93.)

The geographical divisions adopted in the Tables are :—(1) *Boreal Regions* : the temperate regions of the northern hemisphere, with the exception of temperate China and Japan. (2) *China, Japan* : the temperate parts of China and Japan. (3) *Indo-China* : Siam, French Indo-China, and tropical and subtropical China. (4) *Himalaya* : Tropical Himalaya, Assam, Khasia Hills, and south as far as Tenasserim. (5) *Ceylon* : Ceylon and the Western Ghâts. (6) *West Malaya* : Malay Peninsula, and the Malay Archipelago to the Macassar line, excluding Borneo. (7) *Borneo.* (8) *The Philippines.* (9) *Austro-Malaya* : the Indo-Malayan Archipelago, east of the Macassar line. (10) *Polynesia* (including New Caledonia). (11) *Australia* (including Tasmania). (12) *New Zealand.* (13) *South America.*

The sign + signifies that the same species is common to Kinabalu and the division for which the sign is entered, whilst the sign ∼ indicates that the species is represented by a close congener in the division concerned.

The names of the species described as new in the present paper are denoted by an asterisk.

A. Hill Zone (up to 3000 feet).

	Boreal Regions.	China, Japan.	Indo-China.	Himalaya.	Ceylon.	West Malaya.	Borneo.	Altitudes on Kinabalu.	Philippines.	Austro-Malaya.	Polynesia.	Australia.	New Zealand.	South America.
								feet.						
Polygala venenosa	..	..	~	~	~	+	+	2000–3400	+					
*Garcinia Havilandii	..	..	..	..	..	~	~	2000						
Adinandra excelsa	..	..	..	..	..	~	+	2000						
*Saurauja amœna	..	..	..	..	..	~	~	2500	~	~				
Triumfetta suffruticosa	..	~	~	~	~	+	+	2500	..	+				
*Evodia tenuistyla	..	..	~	~	~	~	~	2000	~					
*Salacia laurifolia	..	..	..	~	~	~	~	2000	~					
Cissus hastata	..	..	..	..	..	+	+	2000						
Guioa pleuropteris	..	..	..	..	..	+	+	2000						
*Bauhinia excurrens	..	..	~	..	..	~	~	2000	~	~				
*—— Burbidgei	..	..	..	..	..	~	+	2000						
Pithecolobium bigeminum	..	..	+	..	+	+	+	2000	+					
Rubus rosæfolius	..	+	+	+	+	+	+	2500–3000	+	+	..	+		
Dichroa febrifuga	..	..	+	+	..	+	+	2000	+	+				
Itea macrophylla	..	..	..	+	..	+	+	2000						
Decaspermum paniculatum	..	..	~	~	..	+	+	2000	+	+	~	~		
Sonerila maculata	..	..	..	+	..	..	+	2500						
Dissochæta annulata	..	..	..	..	..	+	+	1200	..	+				
—— hirsuta	..	..	..	..	..	..	+	2000–3500						
*Kibessia tessellata	..	..	..	..	..	~	~	2000						
Memecylon lævigatum	..	..	~	~	..	+	+	1000–2000	~					
Mussænda frondosa	..	..	..	+	+	+	+	2500	+	+				
*—— coccinea	..	..	..	..	..	..	+	2000–3400						
Randia densiflora	..	..	+	+	+	+	+	2000	+	+	..	+		
Psychotria malayana	..	..	..	..	..	+	+	1000–2000						
Campanumœa celebica	..	..	+	+	..	+	+	2500	..	+				
Clethra canescens	..	..	~	..	..	+	+	2000	~	+				
Leuconotis anceps	..	..	..	..	..	+	+	2000						
Willughbeia firma	..	..	..	..	..	+	+	2000–3000						
Parameria glandulifera	..	..	+	..	..	+	+	2500	+					
Hoya coronaria	..	..	..	..	..	+	+	2000–3000						
Buddleia asiatica	..	..	+	+	+	+	+	2500	+	+				
*Brookea albicans	..	..	..	..	..	..	~	2500						
Æschynanthus tricolor	..	..	..	..	..	+	+	2000–3000						
Thunbergia fragrans	..	..	+	+	+	+	+	2500	+	+	+	..	+	
*Strobilanthes kinabaluensis	..	..	..	..	..	~	..	2000						
Geunsia farinosa	..	..	..	..	..	+	+	2800	+	+				
Polygonum chinense	..	..	+	+	+	+	..	2500	+					
Nepenthes phyllamphora	..	..	+	..	..	+	+	2500	+	+	+			
Scyphostegia borneensis	..	..	..	..	..	..	..	1600						
*Loranthus estipitatus	..	..	+	~	~	+	+	2500	+	~				
Antidesma Moritzii	..	..	..	..	..	+	+	2000	+					
Acalypha stipulacea	..	..	..	..	..	+	+	2500	+	+				
Schizostachyum, sp.	..	..	..	..	..	~	+	1600						
Alsophila latebrosa	..	..	+	+	+	+	+	2000	+	+				
Davallia ciliata	..	..	..	..	..	..	..	2000	+					
—— tenuifolia	..	+	+	+	..	+	+	2000	+	+	+			
Asplenium squamulatum	..	..	..	..	..	+	..	2000	+					
—— borneense	..	..	..	..	..	..	+	2000–3200						
Angiopteris evecta	..	+	+	+	+	+	+	2000–3000	+	+	+	+		
Equisetum debile	..	..	+	+	+	+	+	2000–2500	+	+	+			

B. Lower Mountain Zone (from 3000 to 6000 feet).

	Boreal Regions.	China, Japan.	Indo-China.	Himalaya.	Ceylon.	West Malaya.	Borneo.	Altitudes on Kinabalu.	Philippines.	Austro-Malaya.	Polynesia.	Australia.	New Zealand.	South America.
								feet.						
Illicium, sp.	..	..	~	..	..	..	..	4000						
Michelia (?), sp.	..	..	..	..	..	..	..	5500						
Goniothalamus dispermus	..	..	..	..	..	~	+	3000						
*—— stenopetalus	..	..	..	..	..	~	~	3000						
*—— roseus	..	..	..	..	..	~	~	6000						
Mitrephora Maingayi	..	..	..	..	..	+	+	3000						
*Melodorum kinabaluense	..	..	..	..	..	~	~	3000						
Viola serpens	+	..	+	+	+	+	+	3000						
Polygala venenosa	..	..	~	~	~	+	+	2000–3400						
Saurauja ferox	..	..	..	..	..	+	+	3000	~	~				
*Sterculia translucens	..	..	..	..	..	~	~	5000						
Impatiens platyphylla	..	..	..	..	~	+	+	5000	..	+				
*Evodia subunifoliolata	..	..	..	..	..	..	..	6000	~					
Dysoxylon cauliflorum	.	..	..	..	..	+	+	3200						
*Gomphandra lysipetala	..	..	~	~	~	~	~	6000	~	~				
—— prasina	..	..	..	..	..	+	+	4500	..	+				
Perrotettia alpestris	..	..	..	..	..	+	..	3000	+	..	~			
Sabia parviflora	..	..	..	+	..	..	..	5000						
Rubus glomeratus	..	..	..	~	..	+	+	6000	+	+				
—— rosæfolius	..	+	+	+	+	+	+	2500–3000	+	+	..	+		
—— fraxinifolius	..	~	~	~	~	+	+	3000	+	+	..	~		
Drosera spathulata	..	..	+	..	..	..	..	5000–5500	+	+	..	+	+	
*Decaspermum Vitis-Idæa	..	..	..	..	.	..	..	5500	~					
*Myrtus flavida	..	..	..	..	..	..	..	5500–7700	..	..	~	~		
*Tristania elliptica	..	..	..	..	..	~	~	5500						
Melastoma decemfidum	..	.	+	..	..	+	+	5000–5500						
—— Beccarianum	..	..	~	..	..	..	+	3500						
Blastus Cogniauxii	..	..	~	..	..	..	+	4000–6000						
*Anerincleistus cordatus	..	..	..	..	..	..	+	3500						
*Driessenia glanduligera	..	..	..	..	..	..	~	5000						
*—— microthrix	..	..	..	..	..	..	~	3500						
Sonerila tenuifolia	..	..	..	..	..	+	+	3500						
*—— kinabaluensis	..	..	..	..	..	~	~	3200						
*—— pulchella	..	..	..	..	..	~	~	6200						
—— borneensis	..	..	..	..	..	~	+	3000						
*Phyllagathis elliptica	..	..	~	..	..	~	~	4000–5000						
*—— uniflora	..	..	..	..	..	..	..	6000						
Marumia pachygyna	..	..	..	..	..	~	+	3000						
Dissochæta hirsuta	..	..	..	..	..	..	+	2000–3500						
*Medinilla urophylla	..	..	..	..	..	~	~	3500	..	~				
*—— lasioclada	..	..	..	..	..	..	..	6000	~	~				
*Anplectrum homœandrum	..	..	..	..	..	..	..	6000	~					
Memecylon lanceolatum	..	..	~	~	..	~	+	6000	~					
*Plethiandra Hookeri	..	..	..	..	..	..	~	4500						
Casearia leucolepis	..	..	..	..	..	+	+	......	+	~				
*Begonia adenostegia	..	..	..	..	..	~	~	4500						
*—— oblongifolia	.	..	..	..	..	~	~	3000	~					
—— borneensis	..	..	..	..	..	..	+	6000	~					
*—— inostegia	..	..	..	..	..	..	~	6000	~					
Hydrocotyle javanica	..	+	+	+	+	+	+	3000	+	..	..	+		
Arthrophyllum diversifolium	..	..	..	..	..	+	+	3500						
Wendlandia paniculata	..	..	+	+	..	+	+	3000	~	+				
*Argostemma gracile	..	..	..	..	..	~	~	3500						
*—— brachyantherum	..	..	..	..	..	~	~	3000	~					
*Hedyotis protrusa	..	..	..	..	..	..	..	5500	~					
*Mussænda coccinea	..	..	..	..	..	.	+	2000–3400						
Acranthera Atropella	..	..	..	~	..	~	~	5000–6000						

B. Lower Mountain Zone (*continued*).

	Boreal Regions.	China, Japan.	Indo-China.	Himalaya.	Ceylon.	West Malaya.	Borneo.	Altitudes on Kinabalu.	Philippines.	Austro-Malaya.	Polynesia.	Australia.	New Zealand.	South America.
								feet.						
*Myrioneuron borneense	..	..	..	..	..	..	..	3000	..	~				
*Urophyllum lineatum	..	..	..	..	..	..	..	5500						
*—— salicifolium	..	..	..	..	..	..	~	6000						
*Ixora kinabaluensis	..	..	..	..	..	~	..	5000						
*Pavetta limbata	..	..	~	~	~	~	~	6000	~	~	..	~		
*Psychotria gyrulosa	..	..	..	..	..	~	~	3200						
*—— iteophylla	..	..	..	~	..	..	..	3500						
*Streblosa urticina	..	..	..	..	..	~	..	3200						
*Gærtnera rufinervis	..	..	..	..	..	~	..	6000						
*Chasalia gracilis	..	..	..	..	..	~	..	3500						
*Lasianthus kinabaluensis	..	..	..	~	..	~	..	3000–3200						
*—— membranaceus	..	..	..	..	~	..	..	3000–5000						
Pratia borneensis	..	..	..	..	..	..	+	3000	..	..	..	..	~	
*Pentaphragma aurantiacum	..	..	..	..	..	~	~	6000	..	~				
Vaccinium, sp.	..	..	..	..	..	~	~	3000						
*—— pachydermum	..	..	..	..	..	~	..	5500–10,500						
*—— micrantherum	..	..	..	..	..	~	..	3500						
*Diplycosia pinifolia	..	..	..	..	..	..	..	3500						
*—— penduliflora	..	..	..	..	..	..	~	5000						
*—— urceolata	..	..	..	..	..	..	..	6000						
*—— memecyloides	..	..	..	..	..	..	~	6000						
Rhododendron crassifolium	..	..	..	..	..	~	~	5000	~					
*—— stenophyllum	..	..	..	..	..	..	~	5000–8000						
*—— durionifolium	..	..	..	..	..	~	+	4000–7000	~					
*—— lacteum	..	..	..	..	..	~	..	3500						
Leucopogon malayanus	..	..	..	..	..	+	+	5500	..	..	..	~	~	
Mæsa indica	..	..	+	+	+	+	+	4000–5000	+	+				
Myrsine, sp.	..	..	..	..	..	..	..	5500						
Labisia pothoina	..	..	..	..	..	+	+	3000–4000						
*Embelia phæadenia	..	..	..	..	~	~	..	6000	~					
*Ardisia oocarpa	..	..	~	~	..	..	..	3000						
*—— brachythyrsa	..	..	..	..	..	~	~	3000						
—— virens	..	~	+	+	..	~	~	3500						
*—— amabilis	..	..	..	..	..	..	..	6000						
—— oxyphylla	..	..	..	..	..	+	+	5000						
—— villosa	..	..	..	..	..	+	+	4500						
Diospyros, sp.	..	..	..	..	..	..	~	3000						
——, sp.	..	..	..	..	..	..	~	3000						
*Symplocos adenophylla	..	..	..	..	..	+	+	5500–7000						
*—— læteviridis	..	..	..	~	..	..	..	4000						
*—— Johniana	..	..	..	..	..	~	..	6000						
Rauwolfia serpentina	..	..	..	+	+	+	+	3000						
Alyxia, sp.	..	..	..	..	..	~	..	5000						
Solanum biflorum	..	..	+	+	+	+	+	5000	+	+				
Utricularia orbiculata	..	..	..	+	+	+	+	5500						
*Æschynanthus magnifica	..	..	..	..	..	~	~	6000						
*Dichrotrichum bracteatum	..	..	..	..	..	..	..	5000						
*Chirita areolata	..	..	..	..	..	..	..	5000–7000						
Cyrtandra Burbidgei	..	..	..	..	~	~	~	5000						
—— trisepala	..	..	..	..	..	..	+	3000						
*Strobilanthes galeopsis	..	..	..	..	..	..	..	5000–7000	..	~				
*Premna cauliflora	..	..	..	..	..	..	..	3000–3200						
*Clerodendron kinabaluense	..	..	..	..	..	~	~	3200						
Phlomis rugosa	..	..	..	+	..	+	+	3500	+					
Nepenthes Edwardsiana	..	..	..	..	..	..	..	4000–9000						
—— Rajah	..	..	..	..	..	..	+	4000–7000						
Peperomia candida	..	..	..	..	..	+	+	6000						

B. Lower Mountain Zone (*continued*).

	Boreal Regions.	China, Japan.	Indo-China.	Himalaya.	Ceylon.	West Malaya.	Borneo.	Altitudes on Kinabalu.	Philippines.	Austro-Malaya.	Polynesia.	Australia.	New Zealand.	South America.
								feet.						
Chloranthus brachystachyus ..	..	+	+	+	+	+	+	6000						
*Litsæa cauliflora	..	..	..	..	..	~	~	5000						
*Lindera grandifolia	..	..	..	..	..	~	~	3000	..	~				
Helicia erratica	..	..	+	+	..	~	..	5000	~					
*Glochidion tenuistylum	..	..	..	..	~	..	..	4000						
Baccaurea lanceolata	..	..	..	..	..	+	+	3000						
Antidesma auritum	..	..	..	..	..	+	..	4000						
*Claoxylon pauciflorum	..	..	..	~	..	~	..	3000						
Acalypha caturus	..	..	..	..	..	+	+	3000	..	~				
Laportea stimulans	..	..	..	..	..	+	+	5000	+					
——, sp.	..	..	..	..	..	~	~	3000	~					
*Pilea pterocaulis	..	..	..	~	..	~	..	3000						
*—— crassifolia	..	..	..	~	..	~	..	3000						
*Elatostemma lineare	..	..	..	~	..	..	..	5000						
*—— Lowii	..	..	..	..	..	..	..	5000	..	~				
*—— thalictroides	..	..	..	..	..	..	..	5000	~					
Burmannia longifolia	..	..	..	..	..	+	+	5000	+	+				
*—— papillosa	..	..	..	..	..	..	~	3200						
Microstylis calophylla	..	..	..	..	..	+	..	3000						
*Platyclinis corrugata	..	..	..	..	..	..	..	5500						
*Bulbophyllum montigenum ..	..	..	..	..	..	..	..	6000						
*—— breviflorum	..	..	..	..	..	..	..	6000						
*Dendrochilum conopseum	..	..	..	..	..	..	..	5500						
Eria Kingii	..	..	..	..	..	+	..	6000						
*—— angustifolia	..	..	..	..	..	..	..	6000						
—— ferox	..	..	..	..	..	+	..	6000						
Spathoglottis aurea	..	..	..	..	..	+	..	4000						
*Calanthe ovalifolia	..	..	..	..	..	..	..	3000						
*Bromheadia rigida	..	..	..	..	..	~	..	6000						
*Appendicula congesta	..	..	..	..	..	..	..	4000						
Alpinia, sp.	..	..	..	..	..	~	~	5000						
*Patersonia Lowii	..	..	..	..	..	..	..	5000–5500	..	..	..	~		
*Aletris foliolosa	..	..	..	..	..	+	~	5500–7700						
Smilax odoratissima	..	..	..	+	..	+	+	3000	+					
—— leucophylla	..	..	+	..	..	+	+	5500	+	+				
Dianella ensifolia	..	+	..	+	+	+	+	5500–8000	+	+	+	+		
*Eriocaulon Hookerianum	..	..	~	..	~	..	..	5500–7700						
*Cladium samoense	..	..	.	..	..	..	..	5500	..	..	+	..	~	
*—— borneense	..	..	..	..	..	..	+	5000						
Schœnus melanostachyus	..	..	..	..	..	..	..	5500–11,000	..	..	..	+	+	
Miscanthus sinensis	..	+	+	..	..	..	..	5000	~	~	~			
Dinochloa, sp.	..	..	..	..	..	~	..	3000						
Gleichenia circinata	..	..	..	..	..	..	+	5000–10,500	..	..	+	+	+	
Hymenophyllum dilatatum ..	..	..	+	..	..	+	+	5000–7000	+	+	+	..	+	
Trichomanes rigidum	..	+	+	..	+	+	+	5000–7000	..	+	+	..	+	+
—— apiifolium	..	..	..	..	..	+	..	6000	+	.	+	+		
—— maximum	..	..	..	..	..	+	+	5000–6000	+	+	+	+		
—— Pluma	..	..	..	..	..	+	+	5000–6000						
—— trichophyllum	..	..	..	..	..	+	+	5000–6000	..	+	+			
Lindsaya jamesonioides	..	..	..	..	..	..	..	5500–9000						
—— flabellulata	..	+	+	+	+	+	+	......	..	+	..	+		
Asplenium borneense	..	..	..	..	..	..	+	2000–3200						
—— dichotomum	.	..	..	..	..	..	+	3000–5000						
*—— biseriale	..	..	..	..	..	..	..	3000						
—— latifolium	..	..	+	..	+	+	+	......	+					
Didymochlæna lunulata	..	..	..	..	..	+	+	3500	+	+	+	..	..	+
Gymnogramme avenia	..	..	..	..	..	+	+	......	..	+				

B. Lower Mountain Zone (*continued*).

	Boreal Regions.	China, Japan.	Indo-China.	Himalaya.	Ceylon.	West Malaya.	Borneo.	Altitudes on Kinabalu.	Philippines.	Austro-Malaya.	Polynesia.	Australia.	New Zealand.	South America.
								feet.						
Acrostichum bicuspe	..	..	+	..	..	+	..	4000–8000	..	+				
Schizæa malaccana	..	..	..	..	..	+	..	5000	+					
Lycopodium serratum	.	+	+	+	..	+	+	4000	+	+	+			
Selaginella caulescens	..	+	+	+	..	+	+	3000	+	+				
—— Willdenowii	..	..	+	+	..	+	+	3000	..	+				
Dicranum assimile	..	..	..	+	..	+	..	6000						
Campylopus exasperatus	..	..	..	..	..	+	..	3200–9000	..	..	+			
Eucamptodon edentulus	..	..	..	..	..	..	..	5000						
Leucophanes squarrosum	..	..	..	..	..	..	..	6000	+					
*Schlotheimia splendida	..	..	..	..	..	..	..	5000						
Mnium rostratum	..	..	..	..	..	..	..	5000						
Pogonatum macrophyllum	..	..	..	..	..	+	..	6000						
Taxithelium Dubyanum	..	..	..	..	..	+	..	5000	..	+				
*Mniodendron microloma	..	..	..	..	..	..	..	6000						
—— Korthalsii	..	..	..	..	..	+	..	5000	..	..	+			
Hypnodendron Reinwardtii	..	..	..	..	..	+	..	6000	..	+				
Rhacopilum spectabile	..	..	..	..	..	+	..	6000	+					
Plagiochila tenuis	..	..	..	+	..	..	..	6000	..	..	+			
Chiloscyphus aselliformis	..	..	..	..	..	+	..	5000						
Mastigobryum, sp.	..	..	..	..	..	..	..	6000						
Lepidozia Wallichiana	..	..	..	+	..	..	..	6000						
Trichocolea tomentella	..	..	..	..	..	..	..	6000						

C. Upper Mountain Zone (from 6000 to 10,500 feet).

	Boreal Regions.	China, Japan.	Indo-China.	Himalaya.	Ceylon.	West Malaya.	Borneo.	Altitudes on Kinabalu.	Philippines.	Austro-Malaya.	Polynesia.	Australia.	New Zealand.	South America.
								feet.						
Drimys piperita	..	..	..	..	..	..	+	6600–11,000	+	+	..	~		
*Ternstrœmia Lowii	..	..	..	..	..	~	~	9000						
*Adinandra verrucosa	..	..	..	..	..	..	..	8000						
*Saurauja actinidiifolia	..	..	..	..	..	~	~	7000	~	~				
Schima brevifolia	..	..	~	..	..	~	~	8000–11,000						
*Elæocarpus sericea	..	..	..	..	..	~	..	8800						
Ilex spicata	..	..	..	..	..	+	+	7000						
*—— vacciniifolia	..	..	..	~	..	~	~	8800	~					
Microtropis ramiflora	..	..	..	..	+	..	+	8000						
*Rhus borneensis	..	..	..	..	..	..	..	6000–8000						
*Pygeum oocarpum	..	..	..	~	..	~	..	7800						
*Rubus Lowii	..	..	..	~	..	~	~	9000–13,000						
—— alpestris	..	..	..	+	..	+	+	7600						
—— lineatus	..	..	..	+	..	+	+	10,500						
*Polyosma Hookeri	..	..	..	..	..	..	..	8000–10,500						
*—— bracteosa	..	..	..	..	..	..	..	9000						
Leptospermum recurvum	..	..	..	..	..	~	..	7000–13,000	~	..	..	~		
—— javanicum	..	..	..	..	..	+	..	7700	..	..	~	~		
*Myrtus flavida	..	..	..	..	..	..	..	5500–7000						
*Tristania bilocularis	..	..	..	..	..	~	~	6600						
*Eugenia kinabaluensis	..	..	..	..	~	..	..	8800						
*—— Myrtillus	..	..	..	..	..	..	..	8800						

C. Upper Mountain Zone (*continued*).

	Boreal Regions.	China, Japan.	Indo-China.	Himalaya.	Ceylon.	West Malaya.	Borneo.	Altitudes on Kinabalu.	Philippines.	Austro-Malaya.	Polynesia.	Australia.	New Zealand.	South America.
								feet.						
*Sonerila crassiuscula	..	..	..	..	..	~	~	9000						
*Medinilla stephanostegia	..	..	..	~	..	~	..	7600						
*Begonia Burbidgei	..	..	..	..	..	~	~	7600						
*Trachymene saniculæfolia	..	..	..	..	..	..	..	7000–13,000	..	..	..	~		
*Hedyotis pulchella	..	..	..	..	..	..	..	7000–9000	~					
*—— macrostegia	..	..	..	..	..	..	~	8000–12,000	~					
*Lucinæa pentacme	..	..	..	..	..	..	~	6600						
*—— nervulosa	..	..	..	..	..	..	~	7000						
*Urophyllum cyphandrum	..	..	..	..	..	~	~	7800						
*—— longidens	..	..	..	..	..	..	..	7600						
*—— subanurum	..	..	..	..	..	~	~	10,500						
*Psychotria densifolia	..	..	..	..	..	~	..	8000						
*Lasianthus euneurus	..	..	..	..	~	..	..	7600						
*—— rotundatus	..	..	..	..	~	..	..	8300						
Nertera depressa	..	..	..	..	..	+	+	10,500	+	+	+	+	+	+
Coprosma crassicaulis	..	..	..	..	..	..	..	10,500	..	..	..	~	~	
Vaccinium coriaceum	..	..	..	..	..	..	~	9000						
—— buxifolium	..	..	..	..	..	..	~	7500–11,800						
*—— cordifolium	..	..	..	..	..	..	..	8800–9000						
*—— pachydermum	..	..	..	..	..	~	..	5500–10,500						
——, sp.	..	..	..	..	..	~	..	8800						
*Diplycosia chrysothrix	..	..	..	..	..	~	~	6600						
*—— rufa	..	..	..	..	..	~	~	7500–8000						
*—— kinabaluensis	..	..	..	..	..	..	..	10,500–12,000						
—— ciliolata	..	..	..	..	..	..	..	6000–8000						
—— heterophylla (?)	..	..	..	..	..	+	+	7600						
*—— punctulata	..	..	..	..	..	~	~	7000						
*—— cinnamomifolia	..	..	..	..	..	~	~	8000–9000						
*—— Myrtillus	..	..	..	..	..	~	~	8700						
Rhododendron Lowii	..	..	..	..	..	~	~	8000–10,000	~	+				
—— Brookeanum	..	..	..	..	..	..	~	7800						
—— stenophyllum	..	..	..	..	..	..	~	5000–8000						
—— rugosum	..	..	..	..	..	..	~	7000–10,000						
—— acuminatum	..	..	..	..	..	~	~	6000–8000	~					
—— durionifolium	..	..	..	..	..	~	+	4000–7000	~					
—— verticillatum	..	..	..	..	..	..	+	8000–11,500						
*—— cuneifolium	..	..	..	~	..	..	~	7000	~					
—— ericoides	..	..	..	..	..	..	~	8000–10,500	~					
Leucopogon suaveolens	..	..	..	..	..	..	+	7000–13,000	+	..	..	~	~	
Myrsine capitellata	..	..	..	+	+	+	+	8000–11,500						
*Embelia tortuosa	..	..	..	..	..	..	..	8800						
—— coriacea	..	..	..	..	..	+	+	7600–8800						
*—— minutifolia	..	..	..	..	..	~	..	8500	~					
Ardisia javanica	..	..	..	..	..	+	+	8800						
Symplocos adenophylla	..	..	..	..	..	+	+	5500–7000						
—— zizyphoides	..	..	..	..	..	~	..	10,500						
*—— deflexa	..	..	..	..	..	~	..	8800						
Alyxia lucida	..	..	..	..	..	+	+	7500						
Gentiana borneensis	~	~	..	~	~	~	~	7500						
*Euphrasia borneensis	..	..	..	..	..	..	..	8000–12,000	..	..	..	~	~	
Dichrotrichum asperifolium	..	..	..	..	..	+	+	8000–10,500	..	+				
*Didymocarpus areolatus	..	..	..	..	..	..	..	5000–7000						
Cyrtandra Clarkei	..	..	..	..	..	~	..	10,500						
*Strobilanthes galeopsis	..	..	..	..	..	..	..	5000–7000	..					
Nepenthes Lowii	..	..	..	..	..	..	..	6000–8000						
—— villosa	..	..	..	..	..	..	..	7000–9000	.					
—— Edwardsiana	.	..	..	..	..	..	..	4000–9000						

C. Upper Mountain Zone (*continued*).

	Boreal Regions.	China, Japan.	Indo-China.	Himalaya.	Ceylon.	West Malaya.	Borneo.	Altitudes on Kinabalu. (feet.)	Philippines.	Austro-Malaya.	Polynesia.	Australia.	New Zealand.	South America.
Nepenthes Rajah	..	..	..	..	..	..	+	4000–7000						
—— tentaculata	..	..	..	..	..	..	+	6000–9000						
Litsæa zeylanica	..	..	~	~	+	+	+	8000	+	+				
Lindera cæsia	..	..	..	~	..	+	+	8000						
*Loranthus sabaensis	..	..	..	..	..	~	~	9000–11,000	~					
*—— centiflorus	..	..	..	..	..	..	..	6500						
Daphniphyllum borneense	..	~	~	~	~	..	..	10,000–11,000						
*Ficus setiflora	..	..	..	..	..	~	..	7600						
*—— kinabaluensis	..	..	..	~	..	~	..	8000						
—— Motleyana	..	..	..	..	..	..	+	8800						
Elatostemma bulbothrix	..	..	..	..	..	..	..	10,000						
*Quercus Havilandii	..	..	..	..	..	..	~	9000–10,500	+					
*Castanopsis turbinata	..	..	..	..	..	..	~	8500						
——, sp.	..	..	..	..	..	..	..	8000	~					
Platyclinis grandiflora	..	..	..	..	..	..	..	10,500						
*Dendrobium kinabaluense	..	..	..	..	..	..	..	7000						
*Bulbophyllum catenarium	..	..	..	..	..	+	+	6500						
*—— coriaceum	..	..	..	..	..	..	..	10,500						
*—— altispex	..	..	..	..	..	~	..	8000						
*Eria grandis	..	..	..	..	..	..	..	10,000–12,000						
*Nephelaphyllum latilabre	..	..	..	.	..	~	..	6500						
Calanthe parviflora	..	..	..	..	..	+	..	7000						
*Cœlogyne papillosa	..	..	..	..	..	..	..	8000–10,500						
*Habenaria borneensis	..	..	..	..	..	..	..	10,000						
*Patersonia borneensis	..	..	..	..	..	..	..	......	..	..	..	~		
*Aletris foliolosa	..	..	..	..	..	+	~	5500–7700						
*—— rigida	..	..	..	..	..	~	..	8000–11,500						
Smilax lævis	..	..	+	.	..	+	+	7800						
Dianella ensifolia	..	..	..	+	+	+	+	5500–8000	+	+	+	+		
*Eriocaulon Hookerianum	..	..	~	..	~	..	..	5000–7700						
*Cladium samoense	..	..	..	..	..	..	..	5500–11,000	...	..	+			
Schœnus melanostachyus	..	..	..	..	..	..	..	5500–11,000	..	..	..	+	+	
Carex hypsophila	..	..	..	..	..	+	..	10,000						
—— filicina	..	..	..	+	+	+	..	10,500						
Isachne Kunthiana	..	~	~	..	+	+	~	8000	~	~	..	~	~	~
*Deyeuxia epileuca	..	..	..	..	..	..	..	10,500	..	..	..	~	~	
Phyllocladus hypophylla	..	..	..	..	..	..	+	8000–12,000	..	+				
Dacrydium elatum	..	..	+	..	..	+	+	6600						
——, sp.	..	..	~	..	..	~	~	8000–11,000						
Podocarpus cupressina	..	.	+	..	..	+	+	6600–11,000	..	..	+			
Gleichenia circinata	..	..	..	..	..	..	+	5000–10,500	..	..	+	+	+	
*Cyathea polypoda	..	..	..	..	..	..	..	7000						
*—— Havilandii	..	..	..	..	..	..	..	10,500						
Hymenophyllum dilatatum	..	..	+	..	..	+	+	5000–7000	+	+	+	..	+	
*Trichomanes microchilum	..	..	..	..	..	..	..	7000						
—— rigidum	..	+	+	..	+	+	+	5000–7000	+	+	+	..	+	+
—— apiifolium	..	..	..	..	..	+	+	6000	+	+	+	..	+	
Davallia contigua	..	..	..	..	+	+	+	10,500	+	..	+			
—— Veitchii	..	..	..	..	..	+	+	6000–7000	+	+	+			
—— alpina	..	..	..	..	..	+	+	10,500	..	..	+			
Lindsaya jamesonioides	..	..	..	..	..	..	..	5500–9000						
Pteris incisa	..	..	+	+	+	+	+	7000	+	+	..	+		
Asplenium laserpitiifolium	..	..	+	+	..	+	+	8000	+	+	+	+		
*Nephrodium gymnopodum	..	..	..	..	..	..	..	10,500						
Polypodium soridens	..	..	..	..	..	..	+	8000	+					
*—— Havilandii	..	..	..	..	..	..	..	10,500						
—— cucullatum	.	..	..	..	+	+	+	10,500	+	..	+			
—— blechnoides	..	..	..	..	..	+	+	10,500	..	+	+	+		

C. Upper Mountain Zone (*continued*).

	Boreal Regions.	China, Japan.	Indo-China.	Himalaya.	Ceylon.	West Malaya.	Borneo.	Altitudes on Kinabalu.	Philippines.	Austro-Malaya.	Polynesia.	Australia.	New Zealand.	South America.
								feet.						
Polypodium stenophyllum....	..	..	..	..	..	+	+	10,500	+					
—— laciniatum...........	..	..	..	..	..	+	..	10,500						
Vittaria sulcata	..	..	..	..	+	+	..	10,500	..	+				
Acrostychium bicuspe	..	..	+	..	..	+	..	4000–8000	..	+				
Lycopodium casuarinoides ..	..	..	+	+	..	+	+	8700	+					
—— volubile	..	..	..	..	..	+	+	8000	+	..	+	..	+	
Campylopus exasperatus	..	..	..	..	..	..	..	9000						
*Sematophyllum panduriforme .	..	..	..	..	..	..	..	6500						
Schlotheimia rubiginosa	..	..	..	..	..	..	..	10,500						

D. Summit Zone (above 10,500 feet).

	Boreal Regions.	China, Japan.	Indo-China.	Himalaya.	Ceylon.	West Malaya.	Borneo.	Altitudes on Kinabalu.	Philippines.	Austro-Malaya.	Polynesia.	Australia.	New Zealand.	South America.
								feet.						
*Ranunculus Lowii	..	..	..	..	..	..	..	11,000–12,000	..	~	..	~		
Drimys piperita	..	..	..	..	..	..	+	6600–11,000	+	+	..	~		
Eurya reticulata	..	~	~	~	~	+	+	11,000–13,000	~	~	~			
Schima brevifolia	..	..	~	..	..	~	~	8000–11,000						
*Ilex revoluta	..	~	..	~	..	~	~	11,000	~					
*Rubus Lowii	..	..	..	~	..	~	~	9000–13,000						
Potentilla leuconota	..	..	..	+	..	..	..	11,000–13,000	..	+				
—— Mooniana	..	..	..	+	+	..	..	11,000						
*—— parvula	..	..	..	~	~	..	..	11,000						
*Stranvæsia integrifolia	..	..	~	~	..	..	..	11,500–13,000						
Haloragis micrantha	..	+	+	+	..	+	+	12,000	..	..	..	+	+	
Leptospermum recurvum	..	..	..	..	..	~	..	7000–13,000	~	..	..	~		
*Eugenia ampullaria	..	..	..	..	~	..	..	11,500						
*Trachymene saniculæfolia	..	..	..	..	..	..	..	7000–13,000	..	..	..	~		
*Hedyotis macrostegia........	..	..	..	..	..	..	~	8000–12,000	~					
*Coprosma Hookeri	..	..	..	..	..	..	..	13,000	..	..	..	~	~	
Vaccinium buxifolium	..	..	..	..	..	..	~	7500–11,800						
*Gaultheria borneensis	..	..	..	..	..	..	..	12,000	..	..	..	~	~	
*Diplycosia kinabaluensis	..	..	..	..	..	..	..	10,500–12,000						
Rhododendron verticillatum ..	..	..	..	..	..	..	+	8000–11,500						
—— buxifolium	..	..	..	..	..	..	~	12,000						
Leucopogon suaveolens	..	..	..	..	..	..	+	7000–13,000	+	..	..	~	~	
Myrsine capitellata	..	..	..	+	+	+	+	8000–11,500						
*—— dasyphylla............	..	..	..	~	~	~	~	11,000						
*Embelia spiræoides	..	..	..	..	~	~	..	11,500	~					
*Symplocos buxifolia	..	..	..	..	..	~	..	13,000						
*Gentiana lycopodioides	~	~	..	+	+	+	+	11,000						
*Havilandia borneensis	..	..	..	..	..	..	..	11,000–11,500						
*Euphrasia borneensis........	..	..	..	..	..	..	..	8000–12,000				~	~	
Drapetes ericoides	..	..	..	..	..	..	..	12,000–13,000	..	+	..	~	~	
*Loranthus sabaensis	..	..	..	..	..	~	~	9000–11,000	~					
Balanophora elongata........	..	..	..	..	..	+	+	11,000						
*Daphniphyllum borneense	..	~	~	~	~	..	..	10,000–11,000						
*Pilea Johniana	..	..	..	..	..	..	..	11,000–12,000						
*Elatostemma lithoneuron	..	..	..	..	..	..	..	11,000						

D. Summit Zone (*continued*).

	Boreal Regions.	China, Japan.	Indo-China.	Himalaya.	Ceylon.	West Malaya.	Borneo.	Altitudes on Kinabalu.	Philippines.	Austro-Malaya.	Polynesia.	Australia.	New Zealand.	South America.
								feet.						
Myrica javanica	..	..	..	..	..	+	+	11,000–11,500						
*Platyclinis grandiflora	..	..	..	..	..	..	..	10,500						
*—— stachyodes	..	..	..	..	..	..	..	11,000						
*Bulbophyllum montense	..	..	..	..	..	..	..	11,000						
*Eria grandis	..	..	..	..	..	..	..	10,000–12,000						
*Aletris rigida	..	..	..	..	..	~	..	8000–11,500						
Scirpus inundatus	..	..	+	..	..	..	..	11,000	..	..	..	+	+	
*—— Clarkei	..	~	~	..	~	~	..	11,000						
Schœnus apogon	..	..	+	..	..	..	..	11,000–13,000	..	..	..	+		
*Cladium samoense	..	..	..	..	..	..	..	5500–11,000	..	..	+			
Carex rara	..	~	..	+	+	..	..	11,000	..	..	..	~		
—— fusiformis	..	..	..	+	..	..	..	11,000						
Deschampsia flexuosa	+	..	..	..	..	..	..	13,000	..	..	..	..	..	+
Agrostis canina	+	..	..	+	..	..	..	13,000	..	..	..	..	+	+
Phyllocladus hypophylla	..	..	..	..	..	..	+	8000–12,000	..	+	..	~	~	
Podocarpus cupressina	..	..	+	..	..	+	+	6600–11,000	..	..	+			
—— neriifolia	..	+	+	+	..	+	+	11,000–12,000	+					
Lycopodium zeylanicum	..	..	..	..	+	..	..	11,000						
—— Selago	+	..	..	+	..	..	..	11,000	..	..	..	+	+	+
—— Wightianum	..	..	..	..	..	+	+	11,000						
—— clavatum	..	..	..	..	..	..	..	11,000						
Dicranum, sp.	..	..	..	..	..	..	..	11,500						
Rhacomitrium javanicum	..	..	..	..	..	..	..	11,500						
Macromitrium cuspidatum	..	..	..	..	..	..	..	11,000						
*Harrisonia alpina	..	..	..	..	..	..	..	11,500						
Odontoschisma Sphagni	..	..	..	..	..	..	..	11,500						

ENUMERATION OF THE PLANTS COLLECTED ON MOUNT KINABALU, WITH DESCRIPTIONS OF NEW SPECIES.

RANUNCULACEÆ.

RANUNCULUS LOWII, Stapf, in Hook. Ic. Pl. t. 2261. Rhizoma breve, obliquum vel subverticaliter descendens, fibrillis radicinis et fibris (foliorum emarcidorum residuis) creberrime vestitum. Folia *omnia basalia*, 4–6, petiolo 1–7 poll. longo suffulta, *rotundata*, majora 1–1¼ poll., minora interdum vix ½ poll. longa lataque, ad ⅔ triloba, lobis brevibus, latis, apiculatis, integris vel 1–2-dentatis, supra pilis flavidis adpressis, ut petiolus striguloso-hirsuta, subtus glabra. Pedunculi 1–4, *scaposi*, 4–8 poll. longi, aphylli, adpresse hirsuti. Sepala adpressa, ovato-lanceolata, 2–2½ lin. longa, obtusiuscula, margine membranacea, plus minusve hirsuta. Petala obovato-oblonga, 4–5 lin. longa, 1½ lin. lata, aurea, subtus rubro-venia, glabra, basi squamulâ parvâ obtusâ nectarium fovente instructa. Achænia numerosa, receptaculo hirsuto insidentia, arcte congesta, oblique ovata, 1 lin. longa, subinflata, glabra; stylus ½ lin. longus, *rostriformis, curvatus, apice involutus*.

In moist sunny places, from 11,000 to 12,000 feet (*Low; Haviland*, 1055).

Sir F. von Mueller described a very similar species from Mount Victoria in New Guinea under the name of *R. amerophyllus* (Trans. Roy. Soc. Victoria, vol. i. pt. ii. 1). I have

not seen it, but it seems to differ chiefly in the narrower, comparatively longer, leaves and the very dwarf habit. In any case both species are closely allied to, and representatives of, a set of *Ranunculus*-species which inhabit Australia and Tasmania, and group round the multifarious *R. lappaceus*, Sm. *R. Lowii* approaches most nearly in habit the variety *scapigerus* of *R. lappaceus* (particularly certain forms from the highest parts of the Australian Alps and the alpine region of Tasmania), and *R. Muelleri*, Benth., which, however, differs very remarkably in the shape of the beak of the achænium. So far as I can see from Mueller's description, *R. amerophyllus* seems to come nearer to *R. lappaceus* than the Kinabalu plant does.

MAGNOLIACEÆ.

Drimys piperita, Hook. fil. in Hook. Ic. Pl. t. 896; F. von Mueller, Trans. Roy. Soc. Victoria, vol. i. pt. ii. 1.

From 6600 to 11,000 feet (*Low; Haviland*, 1175, 1176, 1177, 1178).

Distribution: New Guinea to the Philippines and Borneo.

The plant was found by Beccari in the Island of Amboina, and he says ('Malesia,' i. p. 18) it is probably the same species which he met with on the tops of almost all the mountains he visited in that region, and at least no. 3235 of his Sarawak collection belongs to it. It was discovered by Sir William Macgregor on Mt. Knutsford in New Guinea, and I think there is hardly any doubt that specimens from the Philippines (*Vidal*, no. 2280, from the district of Lepanto, North Luzon, and no. 3768, without locality) must also be referred to *D. piperita.* This species is nearest allied to *D. dipetala*, F. Muell., a native of New South Wales.

Illicium, sp. Frutex. Rami juniores striato-angulati. Folia elliptica, 4–5½ poll. longa, 2½ poll. lata, obtusa vel subacuminata, coriacea, nervis lateralibus primariis 7–8, 6–8 lin. distantibus. Pedicelli graciles, stricti, 1¼ poll. longi. Sepala ovato-elliptica, obtusa, 3 lin. longa. Petala similia, latiora, 3–4 lin. longa. Stamina 9, vix 2 lin. longa, filamentis oblongis vel ellipticis; antherarum loculi introrsi subparalleli. Carpella 8–9; ovulum ex imâ basi ortum.

Kinitaki, 4000 feet (*Haviland*, 1272).

As I have seen only a branch and two detached incomplete flowers I abstain from giving this plant a specific name, the more so as the limitation even of the better known species from Indo-China is still far from being satisfactory. In any case, the Bornean plant certainly is closely allied to the continental species, perhaps most to *T. cambodianum*, Hance.

Michelia (?), sp.

Maripari Spur (*Low*).

There is only one branch with a flower-bud in the collection. I have not been able to identify it with any of the Magnoliaceæ in the Kew Herbarium. Mr. Burbidge also mentions a "*Magnolia*" in one of his note-books. He found it in the same locality, and describes it as possessing ovate and coriaceous leaves and flowers of 2–4 inches diameter, of a yellow colour "inclining to fuscous," and of the most delicious fragrance.

It is no doubt the same plant as Sir Hugh Low's. As the material is fragmentary, I cannot go beyond the suggestion that it is more likely a species of *Michelia*.

ANONACEÆ.

GONIOTHALAMUS DISPERMUS, Miq. (?), Ann. Mus. Lugd. Bat. ii. 34; Scheffer, Ann. Jard. Bot. Buit. ii. 25.

At 3000 feet (*Haviland*, 1313).

Distribution: Borneo.

G. dispermus, so far as it is represented by a specimen of Miquel's in the Kew Herbarium and by a specimen collected by Motley (no. 1127) near Banjermassin, resembles very much *G. malayanus*, Hook. fil. & Th., but the flowers are twice or three times as large, attaining 2–2¾ in., and golden yellow, not greenish. The plant from Kinabalu has flowers of the same size, shape, and colour; the sepals and the leaves, however, differ slightly. The former are much less hairy, and the outer ones are, except at the base, almost glabrous outside. The difference in the nervation of the leaves is perhaps of more importance. The nerves are very faint and, in leaves of equal length, less numerous, 9–10 against 16–17 in the typical plant, and the transverse venation, which, although very faint, can be distinctly seen in the South Bornean specimens, is almost invisible in the Kinabalu plant, even when the leaves are held against the light. Besides, the leaves of Haviland's plant are more suddenly contracted into the linear blunt acumen. But, taking into consideration the variability of these characters in other species which are better known, I doubt whether they are sufficient to separate the North and the South Bornean plant specifically, and I the less venture to do so as the material at hand consists only of three specimens.

GONIOTHALAMUS STENOPETALUS, Stapf, n. sp. Cortex ramorum floriferum griseo-bruneus, ramulorum bruneus. Folia petiolo nigricante supra valde canaliculato robusto 4–5 lin. longo suffulta, oblonga vel oblongo-lanceolata, 8–10 poll. longa, 2½–3 poll. lata, basi pæne rotundata, abrupte breviterque acuminata, coriacea, utrinque opaca glabraque, nervis lateralibus primariis tenuibus, *utrinque* 13–16, arcuatis et in triente exteriore valde prorsus ductis, *supra subtusque prominulis*, venulis laxe anastomosantibus. Flores singuli, e trunco vel e ramis vetustis orti. Pedunculus 1–1¼ *poll. longus*, nutans, basin versus bracteolis 6–7 parvulis obsitus. Sepala basi connata, triangularia, 3 *lin. longa*, acutiuscula vel subacuminata, glabrata. Petala *exteriora e basi ovatá longissime caudato-acuminata*, 1–1¼ *poll. longa*, 2 *lin. lata*, porrecta, glabrescentia vel pilis rufis adpressis, imprimis basin versus minute strigillosa, uninervia; *interiora* ovata, vix unguiculata, in marginibus albido-, cæterum rufo-puberula, *ad* 7 *lin. longa*, 3–3½ lin. lata. Stamina numerosa, linearia; connectivum depressum, rhomboideum, minutissime papillosum. Ovaria numerosa, glabra; *stylus breviter rostriformis*, incurvus; stigma truncatum, unilateraliter scissum; ovulum basilare solitarium. Carpella matura globoso-ovata, 5 lin. longa, *stipite dimidio minore suffulta*, monosperma.

Penokok, alt. 3000 feet (*Haviland*, 1217).

G. stenopetalus is a very well-marked species, distinguished by the long and narrow outer petals. It approaches most nearly *G. macrophyllus,* Hook. fil. & Th., a species indigenous in Sumatra and Malacca.

GONIOTHALAMUS ROSEUS, Stapf, n. sp. Cortex ut in *G. stenopetalo.* Folia quoque consimillima, imprimis quoad nervationem, sed *majora, pro ratione angustiora* (11½ poll. longa, 2¼ poll. lata), cæterum valde variabilia, in ramulis novellis interdum vix 4 poll. longa. Pedunculus 1½–1¾ poll. longus, robustior. Sepala basi connata, late triangularia, 3–4 lin. longa, acuta, glabrata. Petala *exteriora rosea, e basi late unguiculatâ* ovato-lanceolata, apicem versus longe attenuata, *ad 2½ poll. longa,* 6–7 *lin. lata,* porrecta, uninervia, fere glabra, crassiuscula; *interiora* e basi indistincte unguiculatâ ovata, *ad* 10 *lin. longa, ad* 4–5 *lin. lata,* acuta, in marginibus parce albido-puberula, cæterum fere glabra, *crassa.* Stamina numerosa, linearia; connectivum depresso-capitatum, minutissime papillosum; antherarum loculi distantes. Ovaria numerosa, ovato-oblonga, *aureo-hirsuta,* in stylum 2–3-*plo longiorem,* angulo fere recto curvatum abeuntia; stigma truncatum, unilateraliter fissum; ovulum basilare, solitarium.

At 6000 feet (*Haviland,* 1312).

This plant is so very similar to *G. stenopetalus* in the vegetative parts that I should not hesitate to refer it to that species but for the remarkably different flowers. These are twice or three times as large, and have so different a shape that I cannot think this could be due to a more advanced state; besides, they are much thicker and more fleshy.

MITREPHORA MAINGAYI, Hook. fil. & Thoms. in Hook. fil. Fl. Brit. Ind. i. 77; King, Mat. Fl. Malay Pen. no. iv. 86.

At 3000 feet, Dahombang River (*Haviland,* 1311).

Distribution: From Malacca to South Burma, Java, and Borneo.

I refer this plant with some reluctance to *M. Maingayi.* The leaves are more membranaceous and more glabrous than in any specimen I have seen of *M. Maingayi.* On the other hand, the floral structure is the same, and the same venation of the leaves may be found also in some of the specimens of *M. Maingayi* of the Malay Peninsula. Scheffer described a plant under the name of *M. glabra* (Ann. Jard. Bot. Buit. ii. 20) from Selaboun in Borneo, which evidently is very similar to that from Kinabalu; but there is nothing in the description that would not apply also to *M. Maingayi,* at least in the broad sense in which it is understood by Dr. King.

MELODORUM KINABALUENSE, Stapf, n. sp. Alte scandens, ramis pendulis. Ramuli novelli pilis strictis, dense breviterque fulvo-tomentelli, demum glabrati, nigricantes. Folia petiolo 4–5 lin. longo, supra vix sulcato, fulvo-tomentello, deinde glabro nigricante suffulta, oblongo-elliptica vel oblonga, 3½–4 poll. longa, 1¼–1½ poll. lata, basi rotundata, *obtusa, acuta vel acuminata,* tenuiter coriacea, supra brunea, in costâ strigillosa, cæterum pilis minutis rigidis demum fere detritis obsita, subtus magis olivaceo-viridia, ubique pilis rigidis adpressis minutis strigilloso-puberula, nervis lateralibus 10–13, sub angulo 40°–45° ortis, apice valde prorsus curvatis, vix vero sub margine anastomosantibus. Flores axillares, singuli. Pedunculus primo apice

nutans, sub anthesi strictus, 1 *poll. longus*, *gracilis*, fulvo-tomentellus, basi atque ad medium vel supra vel basi tantum bracteolatus. Sepala vix connata, triangularia, 1–1½ lin. longa, extus fulvo-tomentella. Petala *exteriora* ovata, 5–6 lin. longa, 3–4 *lin. lata, obtusiuscula crassa*, marginibus intus depressis, fere 1 lin. latis, extus pilis adpressis densissime fulvo-subsericea, intus minute griseo-puberula; *interiora* ovata, 2 lin. longa, acuta, valde convexa, extus griseo-fulvo-tomentella, intus glabra. Stamina numerosa; filamenta brevissima; antherarum loculi contigui; connectivum glabrum, ovatum, apice inflexum. Ovaria numerosa, oblique ovoidea, fulvo-hirsuta; stylus brevis; stigma pilis superatum; ovula 4 in serie unicâ.

Penokok, alt. 3000 feet (*Haviland*, 1310).

This species is closely allied to *Melodorum fulgens*, Hook. fil. The indumentum is exactly of the same character as in *M. fulgens*, but less shining on the outer petals.

VIOLACEÆ.

VIOLA SERPENS, Wall. in Roxb. Fl. Ind. ed. Wall. ii. 449, and in DC. Prodr. i. 256; Hook. fil. & Thoms. in Hook. fil. Fl. Brit. Ind. i. 184.

On the Dahombang River, alt. 3000 feet (*Haviland*, 1275).

Distribution: Throughout tropical Asia, except the Philippines and East Malaya; temperate Himalaya.

According to Dr. Haviland the flowers are slightly scented and white, and the lip streaked with violet. The leaves are perfectly glabrous, even in a young state, and the stipules fimbriate. The valves of the mature capsule are about 4 lin. long; besides, there is a capsule on Dr. Haviland's specimens which is globose and 2½ lin. long. It developed evidently from a cleistogamic flower. I think, if we take *V. serpens* in the broad sense of the 'Flora of British India,' we should include also *V. distans*, Wall. The characters taken from the fruit are, in my opinion, reducible to heterocarpy, the capsules derived from normal flowers being always more or less oblong, those from cleistogamic flowers globose. A similar heteromorphy seems to exist with regard to the shape of the stigma, as Hook. fil. & Thoms. have suggested. But, apart from this, it is not unlikely that several species of close affinity are included in *V. serpens*, taken in this broad sense. Yet it seems to me quite hopeless to decide that question from dry material only. In any case, it is evident that one species—if not several nearly related species—is spread from the temperate region of the Himalaya and from South China all over the mountain-region of the Western and Eastern Peninsula, of Ceylon and Malaya, and that this species, or this group of species, is most closely allied to forms which are typically Boreal.

POLYGALACEÆ.

POLYGALA VENENOSA, Juss. in Poir. Dict. v. 493.

On the Tampassuk River near Kiau, from 2000 to 3400 feet (*Low*, *Haviland*, 1349).

Distribution: West Malaya to the Philippines.

HYPERICINEÆ.

HYPERICUM MUTILUM, Linné, Spec. Plant. ed. I. 717.—Confer Maximowicz, in Bull. Ac. Sc. St. Pétersb. xi. 171.

In buffalo pastures at Kiau, alt. 3000 feet (*Haviland*, 1331).

Distribution: Japan; Central and South China; India and Ceylon; Sumatra (*Beccari*, 867), Java and Borneo; New Zealand and Tasmania; Madagascar; North and South America.

A weed, probably of American origin.

CRATOXYLON POLYANTHUM, Korth. Verh. Nat. Gesch., Bot. 175, t. xxxvi.

Tawaran River, alt. 1500 feet (*Haviland*, 1386).

Distribution: Malaya to South Burma, South China, and the Philippines.

GUTTIFERÆ.

GARCINIA HAVILANDII, Stapf, n. sp. Ramuli subtetragoni, brunnei, lenticellis minutis striolati. Folia petiolo circa 4 lin. longo suffulta, elliptica vel ovato-elliptica, $4\frac{1}{2}$–6 *poll. longa*, 2–$2\frac{1}{2}$ *poll. lata*, basi breviter lateque cuneata, apice abrupte in acumen obtusum lineare $\frac{1}{2}$ poll. longum contracta, supra olivaceo- vel obscure viridia, subtus pallidiora, *nervis numerosissimis teneris, utrinque distinctis, subhorizontalibus,* $\frac{1}{4}$–$\frac{3}{4}$ *lin. distantibus.* Flores *masculi* in cymulis paucifloris axillaribus dispositi; pedunculi 1–$1\frac{1}{2}$ lin. longi; pedicelli circa 2 lin. longi, bracteis minutis suffulti. Sepala 4, decussata, *exteriora* 2 rotundato-ovata, $\frac{3}{4}$ lin. longa; *interiora* rotunda, valde convexa, duplo longiora. Petala 4, imbricata, rotunda, $1\frac{1}{2}$ lin. longa, alba. Stamina numerosissima, in phalangis 4 late rotundatis basi connatis; antheræ subsessiles, subglobosæ, coacervatæ, rima apicali vel (in inferis) longitudinali dehiscentes. Ovarium rudimentarium pileiforme, stipite phalangas æquante vel superante, disco integro lato, circa stylum rudimentarium brevissimum leviter impressum.

On the Tampassuk River, near Kiau (*Haviland*, 1379).

The floral structure is almost the same as in *G. merguiensis*, Wight, but the leaves are much larger and show a different venation. As the Kew Herbarium possesses all the types of Pierre's new species of *Garcinia* from Borneo, and nearly all the other Malayan species which possibly might come under consideration, and as I am not able to identify the plant from Kiau with any one of them, I do not hesitate to describe it as a new species, though the material is not perfect. It belongs to the section *Discostigma*, Pierre, a group of distinctly Malayan origin with a feeble outlier in Ceylon.

TERNSTRŒMIACEÆ.

TERNSTRŒMIA LOWII, Stapf, n. sp Frutex dioicus. Ramuli crassi, *cortice* griseo, exsiccato *valde rugoso et irregulariter sulcato.* Folia subverticillata, petiolo $\frac{1}{2}$ poll. longo crasso suffulta, oblonga vel obovato-oblonga, 2–5 poll. longa, 1–2 poll. lata, basi cuneata, rotundato-obtusa vel subemarginata, *valde coriacea, rugulosa, supra*

castanea, plerumque nitidissima, nervis valde obliquis indistinctis utrinque 5–7, *subtus opaca*, pallidiora, *enervia*. Mas: Pedicelli (juveniles) 3 lin. longi, crassi, *recurvi*, sub ipso flore bibracteati; bracteæ ovatæ, carinatæ, crassæ, 1 lin. longæ. Sepala rotundata, *crasse coriacea, valde convexa*, interiora 3 lin. longa. Petala obovato-rotundata, tenuiter membranaceo-marginata, vix 4 lin. longa. Stamina numerosa, polyadelphia; antheræ 1–1¼ lin. longæ, lineari-oblongæ, filamentorum partem liberam æquantes vel breviores; connectivum minutissime apiculatum vel haud productum, obtusum. Femina: Fructus *pedicello incurvo* 5–6 lin. longo suffultus, basi sepalis persistentibus *valde coriaceis* majoribus vix 3 lin. longis circumdatus, *globosus*, coriaceus, 6 *lin. dimetiens*; loculi 2; *semina* 4–6 in utroque loculo, oblonga, triquetra, 2½ *lin. longa.*

Maripari Spur, alt. 5000 feet (*Haviland*, 1262 ♂), alt. 9000 feet (*Haviland*, 1129 ♂; *Low*, ♀).

Ternstrœmia Lowii is nearest allied to *T. bancana*, Miq. (*Adinandra bancana*, King), and *T. coriacea*, Scheffer, but distinguished from both by the generally very shiny veinless leaves, which in a dry state often look as if they were varnished; from the former also by the more terete and comparatively slender branches and the recurved and more slender pedicels; and from the latter by the smaller and very thick sepals, by more globose and smaller berries and more numerous and smaller seeds with acute angles.

ADINANDRA EXCELSA, Korth. Verh. Nat. Gesch. Bot. 109, t. xviii.

On the Tampassuk River near Kiau, alt. 2000 feet (*Haviland*, 1373).

Distribution: Borneo.

A. excelsa comes very near to *A. acuminata*, Korth., particularly as this is represented by Korthals's type; but it differs, in my opinion, sufficiently in the venation of the leaves, especially in the very characteristic marginal arching of the nerves.

ADINANDRA VERRUCOSA, Stapf, in Hook. Ic. Pl. t. 2266. Arbor parva. Rami crassi, nigrescentes, demum pallidiores, glaberrimi, mox lenticellis pallidis prominentibus verrucosi. Folia subdisticha, petiolo crasso supra acute sulcato 3–4 lin. longo suffulta, elliptica, 5–6 poll. longa, 2½–3 poll. lata, obtusa, emarginata, sæpe sub apice paulo contracta, valde coriacea, glaberrima, costâ supra leviter sulcatâ subtus valde prominente et bisulcatâ, nervis lateralibus circa 15 inconspicuis. Pedicelli axillares, fasciculati 3 vel 2 vel solitarii, crassi, recurvi, 3–4 lin. longi, basi bracteis ovatis carinatis adpresse pilosis instructi, apice bracteolas 2 late rotundato-ovatas margine minute pubescente excepto glabras gerentes. Calyx bracteolis arcte approximatus, sepalis rotundis 3–4 lin. latis coriaceis membranaceo-marginatis, margine puberulo-ciliato excepto glabris. Petala rosea, e basi breviter lateque unguiculatâ late elliptica, 7 lin. longa, 4–5 lin. lata. Stamina numerosa, basi connata; filamenta linearia; antheræ lineari-lanceolatæ, in dorso argenteo-sericeæ apiculatæ. Ovarium glabrum, ovato-globosum, sensim in stylum integrum, 6–7 lin. longum abiens. Fructus circa 4 lin. dimetiens. Semina subreniformia, nitida, castanea, punctulata, ½–⅔ lin. longa.

At 8000 feet (*Haviland*, 1101).

A very well-marked species, distinguished by the verrucose branches, the large thickly coriaceous leaves, the short thick pedicels, and the large flowers.

EURYA RETICULATA, Korth. Verh. nat. Gesch. Bot. 118.

From 11,000 to 13,000 feet (*Low; Haviland*, 1067).

Distribution: High mountains of the Malay Archipelago from Sumatra to Borneo.

The Kinabalu plant agrees perfectly with the type specimens of *E. reticulata* and *E. coneocarpa*, Korth., which I find are exactly the same. The stems of Haviland's specimens are covered with a thick coat of *Capnodium elongatum*, Berk. et Desm.

SAURAUJA FEROX, Korth. Verh. nat. Gesch. Bot. 132, t. xix.

At 3000 feet (*Haviland*, 1333).

Distribution: Malaya, from Sumatra to the Philippines (?).

I refer to this species also *Motley*, 332, from Banjermassin, *Beccari*, 1021, from Sarawak, 95 and 131 from Mt. Singalang in Sumatra, and a specimen of Korthals, named "*Saurauja singalensis*, Korth.," and, though with some reluctance, a specimen of *Cuming*, 1712, from Samar in the Philippines. The specimens from Mt. Singalang differ but slightly in the more copious indumentum of the leaves. *S. ferox* is closely allied to *S. Reinwardtiana*, Bl., from Java, and *S. hirsuta*, Bl., from Celebes, and it is very probably identical with *S. tewensis*, Korth., and perhaps also with *S. sakoembangensis*, Korth., both from South Borneo. *S. Reinwardtiana* differs chiefly in the larger bracts, which are very much reduced in *S. ferox*, a character of apparently little importance, and by the more delicate venation, which, however, is of almost exactly the same structure. If *S. ferox* and *S. Reinwardtiana* should indeed prove to be only forms or varieties of one species, the name *S. Reinwardtiana* would stand as the older. A type specimen of *S. tewensis*, Korth., for which I am indebted to Dr. Boerlage of Leyden, agrees almost perfectly with the specimen from Kinabalu so far as the foliage and the branches are concerned. But the only imperfect flower which is still attached to the branch is smaller, and the calyx clothed with a more paleaceous covering.

SAURAUJA AMŒNA, Stapf, n. sp. Arbor parva. Ramuli pallidi, fusco-strigillosi, et præterea squamulis lanceolato-subulatis adpressis conspersi. Folia petiolo indumento consimili vestito 10–14 lin. longo suffulta, obovato-elliptica, 5–6 poll. longa, $2\frac{1}{4}$–3 poll. lata, basi acuta, breviter acuminata, spinuloso-serrulata, supra setulis rufis adpressis strigillosa, obscure brunnea, subopaca, subtus in nervis strigillosa, in venulis hirsutiuscula, pallida; nervis lateralibus primariis angulo 45° ortis, utrinque 11–12, $4\frac{1}{2}$–6 lin. inter se distantibus, marginem versus valde prorsus ductis, nervis secundariis tertiariisque supra indistinctis, infra distinctis, tenuibus, nonnullis inæqualibus e costâ angulo 60°–80°, rarius 90° ortis, leviter prorsus flexis in mediâ viâ ad marginem vel prius cum venulis e nervis primariis ortis anastomosantibus, venulis prope marginem subrectis, vix 1 lin. inter se distantibus. Inflorescentia axillaris, cymosa, bracteata. Pedunculus petiolum æquans vel brevior, ut pedicelli subpatule vel adpresse strigosus. Bracteæ ovatæ vel lanceolatæ, majores ad $\frac{1}{2}$ poll. longæ, structura indumentoque foliorum. Pedicelli sub anthesi 3–4 lin. longi,

apice sæpe incurvi. Sepala basi connata, inæqualia, *exteriora* 3 rotundato-ovata, 6 lin. longa, 4 lin. lata, obtusa vel subacuta, *extus densissime setis hirsutulis incurvo-patulis vestita*, intus glabra, *interiora* 2 subpetaloidea, oblonga, 5 *lin. longa*, 2 *lin. lata*. Petala alba, *ex ungue circa* 5 *lin. longo* $3\frac{1}{2}$ *lin. lato cordata*; *lamina* $5\frac{1}{2}$ *lin. longa*, 6–7 *lin. lata, sinu angusto*. Stamina numerosa, basi connata; filamentorum pars libera antheris vix 1 lin. longis brevior. Ovarium glabrum, hemisphæricum, triloculare; styli filiformes 3.

Near Kiau, alt. 2500 feet (*Haviland*, 1361).

Saurauja amœna belongs to the group of *S. ferox*, but its flowers are larger than in any one of the allied species. The venation of the leaves is very similar to that of *S. setigera*, Korth., and particularly a specimen collected by Beccari in Sumatra, at Ajer Mantjoer in Padang, 715; but these differ in the size as well as in the indumentum of the flowers.

SAURAUJA ACTINIDIIFOLIA, Stapf, n. sp. Ramuli *squamulis lanceolatis primo dense vestiti*, mox vero glabrati, pallidi. Folia petiolo indumento consimili vestito 8–9 lin. longo suffulta, elliptica vel subovata, 3–$4\frac{1}{2}$ poll. longa, $1\frac{1}{2}$–2 poll. lata, basi subrotunda vel vix acuta, acuminata, setuloso-serrulata, supra setulis brevissimis aspersa vel glabrata, subopaca, obscure brunea, subtus in costâ *squamulis iis petioli similibus, in nervis squamulis vel setulis minutis adpressis laxe vestita*, pallida, nervis lateralibus angulo 45° ortis *subrectis, sub ipso margine prorsus curvatis*, utrinque 10–14, 3–$3\frac{1}{2}$ lin. inter se distantibus, *venulis transversis subtus ob colorem obscurum valde conspicuis, vix* 1 *lin. a sese remotis, numerosis, angulo* 50°–60° *ortis, subsigmatoideis*. Flores axillares, solitarii. Pedicelli graciles, 9–12 lin. longi, laxe *squamulosi, sub medio bracteolâ ovatâ muniti*. Sepala imâ basi connata, inæqualia, exteriora 3 rotundato-ovata, 4 lin. longa, 3 lin. lata, acuta vel obtusiuscula, extus *paleis lineari-subulatis hirsutulis adpressis laxe vestita*, intus glabra, interiora 2 angustiora, oblonga, obtusa, extus paleis perpaucis obsita. Petala et stamina ignota. Ovarium (semimaturum) subglobosum, sepalis persistentibus superatum; styli 5 filiformes.

At 7000 feet (*Haviland*, 1232).

The leaves are very like those of *Actinidia strigosa*, Hook. fil. & Th., whence the specific name. A very distinct species of the group of *S. Reinwardtiana*, Blume, well characterized by the paleaceous indumentum, the delicate but conspicuous venation, and the very much reduced inflorescence.

SCHIMA BREVIFOLIA, Baillon, Hist. des Plantes, iv. 254 (adnot.); Stapf, in Hook. Ic. Pl. t. 2264.—Syn. *Gordonia brevifolia*, Hook. fil. in Trans. Linn. Soc. xxiii. 162.

From 8000 to 11,000 feet (*Low*; *Haviland*, 1126, 1127).

Sir Joseph Hooker has pointed out that "the capitate central receptacle of the capsule agrees with Blume's character of Reinwardt's genus *Schima*." *S. brevifolia* is allied to *S. Noronhæ*, Reinw., but it may easily be recognized by the stunted growth, the small and crowded leaves, and the larger flowers.

MALVACEÆ.

Hibiscus Abelmoschus, Linné, Spec. Plant. ed. I. 696.

In rice-fields at Kiau, among long grass and reeds (*Burbidge*).

Distribution: Tropical Asia and Africa; cultivated also in Tropical America.

From a fine coloured sketch by Mr. Burbidge.

STERCULIACEÆ.

Sterculia translucens, Stapf, n. sp. Ramuli pube rigidulâ patulâ et insuper pilis longioribus sparsis vestiti, fulvo-brunei. Folia petiolo 6–10 lin. longo, indumento ramulorum consimili vestito, sub apice subito incrassato suffulta, oblonga vel oblongo-lanceolata, 3–5 poll. longa, $\frac{3}{4}$–$1\frac{1}{4}$ poll. lata, basi acuta, acuminata, integra, utrinque glaberrima, nitidula vel supra tandem opaca, membranacea, translucida, nervis lateralibus utrinque 7–8 valde prorsus ductis, subtus prominulis. Racemi in axillis foliorum superiorum, 3–4 poll. longi, graciles, pilis patulis rufis hirsuti. Flores 3–5, fasciculati in axillis bractearum lineari-lanceolatarum. Pedicelli 3–$1\frac{1}{2}$ lin. longi, hirsuti. Calyx *oblongo-tubulosus*, patule hirsutus; *tubus circa* 3 *lin. longus*, $1\frac{1}{2}$ *lin. latus*; lobi lanceolato-subulati, conniventes, 2 lin. longi. Antheræ vix 10 in apice columnæ $1\frac{1}{2}$ lin. longæ arcte congestæ.

At 5000 feet (*Haviland*, 1196).

S. translucens belongs to the section *Eu-Sterculia* and is nearest allied to *S. gracilis*, Korth., *S. rubiginosa*, Vent., *S. ensifolia*, Mast., and still more nearly to an unnamed species which was collected at Penang by *C. Curtis* (no. 526). But the calyx-tube is longer in *S. translucens* than in any one of them, and almost of exactly the same shape as in an undescribed species from Sarawak (*Beccari*, 1057), which, however, differs totally in the leaves.

TILIACEÆ.

Triumfetta rhomboidea, Jacq. Select. Am. 147, t. xc.

On the banks of the Kadamaian River, alt. 2500 feet (*Haviland*, 1354).

Distribution: Throughout the Tropics of both hemispheres, particularly in Asia and Africa, generally as a weed.

Triumfetta suffruticosa, Blume, Bijdr. 113.

On the Kadamaian River, alt. 2500 feet (*Haviland*, 1348).

Distribution: Malay Archipelago, Solomon Islands, Louisiades (introduced ?).

This plant was originally described from specimens collected in Java. Later on it was found by Riedel in Timor-laut and by R. B. Comins in the Solomon Islands, and there are also specimens from the Louisiade Archipelago (Voy. of 'Rattlesnake,' 467) in the Kew Herbarium. It is very closely allied to *T. pilosa*, Roth, from which it differs in the very scanty tomentum of the leaves, which is limited to a few single hairs on the nerves beneath and to single or poorly fasciculated hairs above, and in the longer peduncles. The bristles of the capsule are either glabrous or ciliate. *T. subhirtella*, Miq., from Java, and *T. graveolens*, Blume, from Java, and according to Miquel from Timor, belong evidently also to *T. suffruticosa*. The specimens from Timor, collected by Riedel, have

partly glabrous fruit-bristles, as they are described to be in *Triumfetta graveolens*; thus at least I understand the term "nudis" in Blume's diagnosis.

Elæocarpus sericeus, Stapf, n. sp. (§ *Acronodia.*) Frutex. Rami glabri, juniores *superne densissime foliati*, vetustiores cortice obscure cinereo. Folia obovato-lanceolata, cuneatim in petiolum 2–3 lin. longum attenuata, 1–1½ poll. longa, ½ poll. lata, obtusa, obtuse crenata, setis deciduis crenis impositis, coriacea, *supra primo adpresse albo-sericea*, demum plus minusve glabrata, *subtus tenuissime denseque subaureo-sericea*, indumento tandem albescente, nervis lateralibus utrinque 6–8 subtus tantum distinctis, reticulatione tenui prominulâ. Stipulæ subulato-lanceolatæ, 2–3 lin. longæ. Racemi 1–1½ poll. longi, pauciflori; rhachis subaureo-sericea; pedicelli 2 lin. longi; bracteæ subulatæ. Sepala 4 ovata, acuta, sericeo-velutina, 2 lin. longa. Petala 4 oblonga, basi paulo constricta, apice dentibus 7–8 breviter linearibus. Stamina 8, effeta (?); filamenta pilosa; antheræ vix 1 lin. longæ, unilateraliter in mucronem brevem pubescentem productæ. Ovarium ovoideo-globosum, 2-loculare, dense rubro-fulvo-sericeum; stylus brevis; ovula 4 in utroque loculo, biseriata.

At 8800 feet (*Haviland*, 1111).

Allied to *E. punctatus*, King, but very distinct in the stunted habit and the fine silky tomentum.

GERANIACEÆ.

Impatiens platypetala, Lindl. Bot. Reg. 1846, t. 68.—Syn. *I. latifolia*, Miq. Ill. Fl. Arch. Ind. 93, non L.

At 5000 feet (*Haviland*, 1235). (This is also the *Impatiens* mentioned by Burbidge in 'The Land of the Sun,' p. 286, as a sketch drawn by Mr. Burbidge on the spot shows.)

Distribution: From Java to Borneo, and probably to New Guinea.

With this species is very probably identical *I. borneensis*, Miq. Ill. Fl. Arch. Ind. 96, described from specimens collected by Korthals in South-east Borneo. I have not seen the type, but a specimen gathered by Motley in the district of Banjermassin agrees perfectly with the description, and at the same time with the specimens, of *I. platypetala* from Java. I suspect also that *I. celebica*, Miq. Ill. Fl. Arch. Ind. 94, is a mere synonym of *I. platypetala*. Miquel does not anywhere mention *I. platypetala*, Lindl., but there is no doubt that he means the same plant by his *I. latifolia*. This, however, is, in my opinion, sufficiently distinct from the true Linnean plant, which is found in Ceylon and the southern part of the Western Peninsula.

RUTACEÆ.

Evodia tenuistyla, Stapf, n. sp. Frutex scandens. Ramuli minute puberuli, glabrescentes, teretes. Folia trifoliolata, petiolo 2½–3 poll. longo minute puberulo supra canaliculato suffulta; foliola inæqualia, petiolulis 2 lin. longis suffulta, *terminale* majus, oblongum, circiter 6 poll. longum, 2–2¼ poll. latum, basi acutum, anguste acuminatum, margine leviter undulatum, tenuiter coriaceum, supra glabrum, nitidum, subtus pallidum, opacum, in costâ et in nervis puberulum, nervis lateralibus 16–18, venularum reticulatione tenuissimâ, venis transversis vix ullis; foliola

lateralia consimillima, circiter 4 poll. longa, $1\frac{1}{2}$ poll. lata. Panicula axillaris, thyrsoidea, petiolo paulo longior, puberula, minute bracteata, floribus in ramulis ultimi ordinis congestis, pedicellis $\frac{1}{2}$–$\frac{3}{4}$ lin. longis. Sepala late ovata, $\frac{1}{4}$ lin. longa, extus puberula. Petala oblonga, vix 1 lin. longa, acuminata. Stamina valde exserta. Ovarium albo-hirsutulum, quadrilobum; *stylus gracilis, apice vix incrassatus*, exsertus.

At Koung on the Tampassuk River, alt. 2000 feet (*Haviland*, 1376).

Evodia tenuistyla has very much in common with *E. Roxburghiana*, Benth., but it differs in the somewhat larger flowers and the slender, not capitate, stigma.

Evodia subunifoliolata, Stapf, n. sp. Frutex. Ramuli pallidi, teretes, tomentelli. Folia opposita, *omnia* (?) *unifoliolata, petiolo* circa 5 lin. longo, *dense tomentello*, subterete, apice subarticulato et interdum plus minusve torto suffulta, foliolum elliptico-vel obovato-oblongum, basi acutum, *abrupte acuminatum*, tenuiter coriaceum, supra glaucum, subnitens, glaberrimum, infra in gemmâ *dense tomentellum, costâ exceptâ, mox glabratum*, nervis lateralibus utrinque 8–10, 1–$1\frac{1}{2}$ lin. sub margine anastomosantibus, utrinque prominulis, venularum reticulatione laxâ. Inflorescentiæ axillares, tomentellæ, pedunculo 1–$1\frac{1}{2}$ poll. longo suffultæ, breves, pauciramulosæ. Flores ignoti. Carpella 1–4, a basi libera, oblique obovoidea, griseo-viridia, tomentella, 4 *lin. longa, plane aperta*, 6–$6\frac{1}{2}$ *lin. lata.* Semina fere semper solitaria, atra, nitida, 2–$2\frac{1}{2}$ lin. dimetientia, funiculo crasso, vix 1 lin. longo.

At 6000 feet (*Haviland*, 1193).

The leaflets somewhat resemble those of *E. triphylla*, DC., but they are covered underneath with a dense soft tomentum in a young state, which persists on the mid-rib, and they usually terminate with a short narrow acumen. In the specimens I have before me the leaves are all unifoliolate, without a trace of lateral leaflets; but Dr. Haviland states on the label "leaves trifoliolate." This may, perhaps, refer to the lower ones. The capsules are much larger than those of *E. triphylla*, and rival those of *E. fraxinifolia*, Hook. fil. As to the affinity, it is difficult to form a precise idea in the absence of flowers. The plant resembles a certain undescribed species from the Island of Panay (*Vidal*, 2275) so far as the leaves are concerned, and it might be a true *Melicope*.

MELIACEÆ.

Dysoxylon cauliflorum, Hiern, in Hook. fil. & Thoms. Fl. Brit. Ind. i. 549.

——, var. tomentella, Stapf. Folia subtus in nervis tomentella, et præterea tota planta indumento vestita densiore quam in speciminibus in peninsulâ Malayanâ collectis observatur.

At the Penokok, alt. 3200 feet (*Haviland*, 1318).

Distribution (of species): Malay Peninsula, from Singapore (*Hullet*, 832) to Penang (*C. Curtis*, 204); Borneo.

I am not able to find any characters of specific distinction between the Peninsular and the Bornean plant. The floral structure is exactly the same in both, except that the flowers are a little larger, if taken on an average, in the specimens from Singapore than in those

from Kinabalu. The leaves of Maingay's, Hullet's, and Curtis's specimens are generally glabrous; but in one of Maingay's plants occur a few scattered hairs on the nerves underneath, exactly like those which compose the denser tomentum in the Kinabalu form.

OLACINEÆ.

Gomphandra lysipetala, Stapf, n. sp. Ramuli *novelli* adpressissime minuteque puberuli, demum glabrati. Folia petiolo supra tenuissime canaliculato 3½–4 lin. longo suffulta, oblongo-lanceolata, 2½–3 poll. longa, ¾–1 poll. lata, basi acuta, obtusiuscule subacuminata, coriacea, supra glaberrima, opaca, subtus in gemmâ dense et minute fulvo-puberula, mox glabrata, nervis lateralibus tenuibus utrinque 3–4. Cymæ axillares pedunculo petiolum æquante suffultæ, 5–15-floræ, minutissime puberulæ vel glabrescentes; flores subsessiles, congesti. Calyx breviter cupularis, vix ¼ lin. longus, brevissime dentatus, puberulus. Petala valvata, *primo cohærentia, demum plane soluta, patentia*, oblonga, 1¼ lin. longa, glaberrima. Filamenta clavata, *antice tantum sub antheris breviter denseque pilis claviculatis obsita, cæterum glaberrima*. Antheræ sub apice affixæ, pendulæ; loculi paralleli vel subparalleli. Ovarium *rudimentarium* leviter asymmetricum, apice parce puberulum.

At 6000 feet (*Haviland*, 1207).

Distinguished by the petals, which finally become quite free and spreading, and by the peculiar arrangement of the hairs on the filaments. Otherwise there is little difference if compared with narrow-leaved forms of *G. axillaris*, Wall., *G. coriacea*, Wight, or *G. polymorpha*, Wight.

Gomphandra prasina (?), Beccari, Males. i. 110.

On the Kadamaian River, at 4500 feet (*Haviland*, 1243).

Distribution: Malaya, from Malacca and Sumatra to Borneo; New Guinea.

Dr. Haviland's specimen is a female with fruits. These are very like those of the Malacca plant, called *G. affinis* by M. Masters in Hook. fil. Fl. Brit. Ind. i. 586, but they are narrower and more strongly ribbed. The habit of the plant also differs, the Kinabalu plant having more slender branches and smaller leaves. *G. javanica*, Valeton, comes so far perhaps nearer, but the shape of the fruit deviates more. The probability, however, is that *G. javanica* and *G. prasina* (including *G. affinis*) belong to one very variable species, the oldest name of which would seem to be *G. prasina*, Becc.

ILICINEÆ.

Ilex spicata, Blume, Bijdr. 1149.

At 7000 feet (*Haviland*, 1201).

Distribution: Malaya, from Malacca and Sumatra (*Beccari*, 130) to Borneo (*Beccari*, 3223, 3273).

Ilex revoluta, Stapf, in Hook. Ic. Pl. t. 2263. Frutex. Rami stricti, dense foliati, subteretes, tomento minutissimo induti, primo canescentes, mox nigrescentes. Folia petiolo 1–1½ lin. longo suffulta, *elliptico-obovata*, ¾–1¼ poll. longa, 4–6 lin. lata, basi breviter

in petiolum acutata, *margine valde revoluto, basi integra a medio vel in parte tertiâ superiore minute glanduloso-serrata, apice obtusa, acuta vel retusa, sæpe mucronulo terminata,* coriacea, supra glabra, *rugulosa, et secundum nervos laterales valde impressa,* subtus in costâ parce puberula, cæterum glabra, glanduloso-punctata, nervis utrinque 4–6, angulo 70°–80° ortis, prominulis vel indistinctis. Stipulæ minutissimæ, subulatæ. Flores *masculi* in *cymis paucifloris, interdum ad flores solitarios redactis,* 3–4 lin. longis, bracteatis puberulis dispositi; pedicelli 2 lin. longi. Sepala rotundata, $\frac{1}{2}$–$\frac{3}{4}$ lin. longa, glabra, minute ciliata. Petala alba, basi connata, rotundata, $1\frac{1}{2}$–$1\frac{3}{4}$ lin. longa. Filamenta antheris multo breviora. Ovarium rudimentarium, globosum. Flores *feminei solitarii,* in axillis foliorum superiorum vel in ramulis abbreviatis; pedicelli puberuli, sursum incrassati, 4 lin. longi. Sepala et petala ut in flore masculo. Ovarium ovatum; stigma sessile, breviter trilobum. *Bacca* nigra, tripyrena, globosa, $3\frac{1}{2}$ lin. dimetiens.

At 11,000 feet (*Haviland,* 1087).

Ilex revoluta is very well marked by the revolute leaves, the apex of which is usually obtuse, with a few minute, sharp teeth, and a more or less distinct mucro. It is nearest allied to *I. crenata,* Thunb., and *I. rugosa,* Max.

ILEX VACCINIIFOLIA, Stapf, n. sp. Frutex. Ramuli stricti, dense foliati, *angulati,* nigrescentes, juniores minutissime atque parcissime puberuli. Folia petiolo 1–$1\frac{1}{4}$ lin. longo suffulta, *obovata vel oblonga,* plerumque 4–7 lin. longa, 3–4 lin. lata, basi acuta, *apice retusa, integra,* coriacea, glabra, supra nigrescentia, nitida, subtus opaca, glanduloso-punctata. Flores (masculi tantum noti) *in racemis axillaribus* 4–6 *lin. longis* 10–20-*floris dispositi,* apicem versus magis congesti ideoque *interdum subumbellati.* Pedicelli graciles, 1 lin. longi. Sepala 4, glabra, basi connata, rotunda, minute ciliata. Petala basi connata, rotundato-ovata. Filamenta brevia. Ovarii rudimentum stigmate sessili lobulato coronatum.

α. Var. CAMPTONEURA. Folia obovata, *subplana, nervis subbasalibus* sub margine apicem versus productis *distinctis,* cæteris plus minusve inconspicuis.

At 6600 feet, on the top of a ridge (*Haviland,* 1186).

β. Var. SUBENERVIS. Folia magis coriacea, plerumque oblonga, *marginibus recurvis, enervia* vel nervo uno alterove subtus prominulo.

At 8800 feet (*Haviland,* 1114).

Like the preceding species, nearest allied to *I. crenata,* Thunb., from which it differs in the entire margin and the retuse apex as well as in the flowers, which are arranged in regular, often subumbellate racemes. The variety *subenervis* is extremely like some of the small-leaved specimens of *I. Walkeri,* Wight, so far as the habit is concerned; but the marginal nerve, instead of forming a distinctly broken line, is steadily curved, and the inflorescence is totally different.

CELASTRINEÆ.

MICROTROPIS RAMIFLORA, Wight, Icon. t. 977.

At 8000 feet (*Haviland,* 1110).

Distribution: Ceylon and Western Ghâts.

PERROTETTIA ALPESTRIS, Lösener, in Engl. Natürl. Pflanzenfam. iii. Th. 5. Abth. 220.

——, var. PHILIPPINENSIS, Stapf.—Syn. *P. philippinensis*, Lösener, l. c.; *Caryospermum philippinense*, Vidal, Rev. Pl. Filip., 89. Flores tetrameri.

A small tree on the Dahombang River, alt. 3000 feet (*Haviland*, 1389).

Distribution (of species): Malaya, from Sumatra to the Philippines.

I find the flowers in Vidal's type specimen of *Caryospermum philippinense* tetramerous, as they are in the Kinabalu plant; while all flowers which I examined from Sumatra and Javan specimens of *P. alpestris*, Lösener, were pentamerous. But apart from this I am not able to indicate any differential characters which might be used for separating these two supposed species. Lösener puts *P. philippinensis* and *P. alpestris* into his section *Caryospermum*, but neither of these specimens has solitary ovules. I dissected a great many flowers and fruits and found the ovary always 2-celled, with 2 erect ovules. In some cases, however, a slight ridge may be seen protruding between the seeds like a false septum, when they fill up the cells. Yet I rather derived the impression that this was the mere mechanical consequence of the pressure of the growing seeds against the soft ovary-walls. The flowers are polygamous, and show all intermediate states from male to female flowers. In the latter the stamens are replaced by almost petaloid, though small, staminodes without any trace of anthers. *P. alpestris* approaches very closely *P. sandwicensis*, A. Gray.

SALACIA LAURIFOLIA, Stapf, n. sp. Frutex glaberrimus. Rami novelli subtetragoni, nigricantes, annotini albidi, teretes. Folia petiolo 2 lin. longo vel breviore suffulta, *lanceolata*, $2\frac{1}{2}$–$3\frac{1}{2}$ poll. longa, 8–10 lin. lata, basi sensim attenuata, apice breviter acuminata, *margine integerrimo* leviter undulato, *crasse coriacea*, fusco-olivacea, nervis lateralibus utrinque 6–7, arcuatis, utrinque prominulis, reticulatione laxâ, indistinctâ. Inflorescentiæ axillares vel extra-axillares, fasciculatæ, 6–10-floræ; pedunculi brevissimi; pedicelli 1 lin. longi. Calyx breviter cupularis, crasse et breviter 5-dentatus. Petala *in alabastro anguste imbricata, oblonga*, 1 *lin. longa, crassa, in dorso carinata et glauca, suberecta.* Stamina 3, ovario medio vel supra insidentia; filamenta late triangularia, apice demum recurva; antheræ subquadratæ, $\frac{1}{8}$ lin. longæ. Styli 3 breves. Ovarium 3-loculare.

Young jungle on the Ulu Tawaran, alt. 2000 feet (*Haviland*, 1370).

Probably nearest to *S. prinoides*, DC., but very distinct by the thick, entire, lanceolate leaves, and the carinate thick petals, which overlap each other only very slightly in bud.

AMPELIDEÆ.

CISSUS HASTATA, Miq. Fl. Ind. Bat., Suppl. 512.—Syn. *Vitis sagittifolia*, M. Lawson, in Hook. fil. Fl. Brit. Ind. i. 645.

At Koung, alt. 2000 feet (*Haviland*, 1372).

Distribution: Malaya, from Penang and Sumatra to Borneo.

Planchon, in DC. Monogr. v. (pars 2) 502, quotes "*Vitis hastata*, Miquel, Fl. Ind. Bat. Supplem. 517," whereas Miquel in the passage cited calls the plant "*Cissus hastata*." It must be therefore *C. hastata*, Miq., instead of Planch.

SAPINDACEÆ.

Guioa pleuropteris, Radlk. Ueber Cupania, &c., in Sitz. Ber. bayer. Akad. Wiss. 1879, 611.—Syn. *Cupania pleuropteris, β. apiculata*, Hiern, in Hook. fil. Fl. Brit. Ind. i. 677.

Young jungle on the Ulu Tawaran, alt. 2000 feet (*Haviland*, 1364).

Distribution: Malaya, from the Peninsula to Borneo.

SABIACEÆ.

Sabia parviflora, Wall. in Roxb. Fl. Ind., ii. [1824] 310.

At 5000 feet (*Haviland*, 1218).

Distribution: Tropical Himalaya, from Sikkim to Kumaon.

ANACARDIACEÆ.

Rhus borneensis, Stapf, n. sp. Frutex, inflorescentiâ exceptâ, glaberrimus. Rami cortice badio vel nigricante. Folia petiolo 2–1 lin. longo vel breviore suffulta, *simplicia, obverse lanceolata vel oblonga*, ad 5 vel 6 poll. longa, ad 2 poll. lata, in petiolum attenuata, apice acuminata, *demum subcoriacea*, nervis lateralibus utrinque 10–17, intermediis circiter 3–3½ lin. inter se distantibus, in foliis novellis cum venis nigricantibus, in maturis subtus prominentibus. Inflorescentiæ a basi ramorum hornotinorum 2–5, bracteis parvis deciduis instructæ, anguste paniculatæ, *masculæ* 1–2 *poll. longæ, femineæ demum* 3–4½ *poll. longæ*; pedicelli ad 1½ lin. longi, pilis minutis adpressis conspersi. Flos masculus: Sepala ovata, 1½ lin. longa, membranaceo-marginata. Petala oblonga, obtusissima, vix 1½ lin. longa, reflexa, nigro-venosa. Stamina 5; filamenta *brevissima*; antheræ ellipticæ, ½ lin. longæ. Ovarii rudimentum minutum trilobum. Flos femineus: Sepala atque petala ut in flore masculo. Stamina plus minusve redacta, effeta. Ovarium oblique ovoideum; stigma sessile, capitatum. Fructus compressus transverse latior, obliquus, 3 lin. longus, 4 lin. fere latus; mesocarpium multistriatum.

At 6000 feet (*Haviland*, 1198).

Inflorescence and flowers are almost exactly as in *Rh. succedanea*, except that the panicles are shorter and the anthers almost sessile. The leaves are simple, without any trace of articulation, and exhibit a type of nervation similar to that in *Rh. succedanea*; the venules, however, are less distinct, probably in consequence of the greater thickness of the leaves.

LEGUMINOSÆ.

Desmodium Scalpe, DC. Prodr. ii. 334.

At 4000 feet (*Haviland*, 1246).

Distribution: Tropical Africa and Natal; Madagascar and Mascarenes; Ceylon and Western Peninsula to Concan; Manipur; Malaya.

Bauhinia excurrens, Stapf, n. sp. (§ *Phanera*). Ramuli glabri, nigrescentes, lenticellis minutis crebre obsiti. Folia petiolo nigrescente, apice et basi incrassato, circiter 1½ poll. longo suffulta, *subcordato-ovata*, 3–4 poll. longa, 2½–3 poll. lata, basi leviter cordata sinu latissimo, *apice abrupte atque brevissime acuminata, nervo medio breviter excurrente*, supra glaberrima, subtus in nervis venisque pilis aureis adpressis minute sericea, nervis 9–11, intermediis 3 approximatis, extimis 2 sæpe inconspicuis, reticulatione venularum tenerrimâ, minutissimâ, sub lente vero distinctissimâ. Inflorescentia terminalis, racemosa, brevis, parce rufo-puberula, bracteis valde caducis. Pedicelli circa 12–14 lin. longi. Calycis tubus cylindricus, 3–4 lin. longus, 1 lin. latus; lobi lineari-lanceolati, acuminati, 7–8 lin. longi, 1¼–1½ lin. lati, in alabastro apice in apiculo cohærentes, sub anthesi reflexi, ut tubus pilis minutis adpressis parce rufo-pubescentes. Petala omnia breviter et abrupte unguiculata, ungue 1 lin. longo, 2 exteriora elliptica, 10 lin. longa, 4 lin. lata, 3 interiora lineari-oblonga, vix 3 lin. lata, omnia plus minusve acuminata, extus et intus, præcipue basin versus, fulvo-pilosula. Stamina *fertilia* 3; filamenta circa 8 lin., antheræ 5–6 lin. longæ; *staminodia* 2, multo breviora. Ovarium dense fulvo-pilosum, breviter et crasse stipitatum, in stylum vix angustiorem sub anthesi duplo longiorem abiens, cum eo 8 lin. longum; stigma magnum, 2 lin. latum.

At Koung, alt. 2000 feet (*Haviland*, 1382).

Closely allied to *B. semibifida*, Roxb., and *B. ferruginea*, Blume, but distinct by undivided apiculate leaves. From *B. integrifolia*, Roxb., and *B. Kockiana*, Korth., it differs considerably in the structure of the flower.

Bauhinia Burbidgei, Stapf, n. sp. (§ *Phanera*). Arbor scandens, 50–60 ped. alta. Ramuli *dense ferrugineo-villoso-tomentosi*, demum glabrescentes. Folia *petiolo 2–2½ lin. longo, robusto ferrugineo-tomentoso* suffulta, oblonga vel elliptico-oblonga, 5–7½ poll. longa, 1¼–2½ poll. lata, basi obtusa, apice plus minusve acuminata, acumine obtuso, interdum leviter emarginato, rarius acuto, sæpe mucronulato, firme membranacea, supra glabra, subtus in nervis primo ferrugineo-velutina, demum glabrata, trinervia, nervis fere ad apicem ductis, supra impressis, subtus prominentibus, venis transversalibus utrinque circiter 15, in vetustioribus sæpe supra impressis, subtus prominulis, distinctis. Racemi terminales, solitarii vel plures ex axillis summis additi, *ferrugineo-villoso-tomentosi*; rhachis 2–3½ poll. longa, fere totâ longitudine florigera, vel basi nuda; pedicelli 1–2½ poll. longi, graciles. Alabastri limbus subglobosus. Calyx *dense ferrugineo-tomentosus*; tubus anguste cylindricus, 5–7 lin. longus; lobi ovati, 3½–4 lin. longi, acuti. Petala 5, paulo inæqualia, coccinea vel purpureo-rubra, late obovata, majora 12–14 lin. longa, 9 lin. lata, abrupte in unguem 1 lin. longum contracta, obtusa, crenulata, extus ferrugineo-sericea, intus subglabra. Stamina fertilia 3, cætera plus minusve redacta, sterilia; filamenta glabra; antheræ fertiles rotundato-ellipticæ, fere 1 lin. longæ. Ovarium ferrugineo-velutinum, mox glabrescens. Legumen lineari-oblongum, 4–5 poll. longum, 14–15 lin. latum, stylo persistente mucronatum, (siccum) nigrum. Semina 5–6, lenticularia, 6–7 lin. dimetientia.

Climbing upon trees on the Tampassuk River near Koung (*Burbidge*).

Distribution: Sarawak (*Beccari*, 633, 3016; *Wallace*); Labuan? (*Low*).

Closely allied to *B. Kockiana*, Korth., but distinct by the very copious, almost villous indumentum, the short and stout petioles, and by the large flowers, the colour of which is much deeper, and perhaps also by the venation of the leaves. Wallace describes the colour as "purple red," Burbidge as "scarlet," whilst Korthals designates the colour of the flowers of *B. Kockiana* as a bright yellow, turning ultimately into red. The typical forms of *B. Kockiana*, as represented by Korthals's specimen, and of *B. Burbidgei* as represented by the specimens quoted above, are certainly distinct enough to be considered as separate species. But there are two specimens here, also collected by Mr. Burbidge in North Borneo—the precise locality is not indicated—which have rather large flowers and exactly the venation of *B. Burbidgei*, but their indumentum and their petioles are exactly like those of *B. Kockiana*. Mr. Burbidge describes the plant named after him in a MS. note thus: "Climbing tree, attaining a height of 50 to 100 feet, twining around forest trees and falling from their branches in masses of green foliage and scarlet flowers."

Pithecolobium bigeminum, Mart. Herb. Fl. Bras. 115; Benth. in. Trans. Linn. Soc. xxx. 575.

In young jungle near the Ulu Tawaran, alt. 2000 feet (*Haviland*, 1369).

Distribution: Ceylon and Western Peninsula; Malaya to the Philippines.

ROSACEÆ.

Pygeum oocarpum, Stapf, n. sp. Frutex. Rami novelli *ferrugineo-tomentosi*, mox glabrati, vetustiores fusci, lenticellis minutis conspersi. Folia petiolo 2–3 lin. longo, crassiusculo, breviter tomentello suffulta, *ovata vel ovato-elliptica*, $1\frac{1}{2}$–2 poll. longa, 1–$1\frac{1}{4}$ poll. lata, *basi subcordata, apice obtusa, margine breviter recurvo, coriacea*, supra in costâ nervisque minute tomentella, cæterum glabra, impresso-punctata, sublucida, basi utrinque glandulâ notata, subtus in costâ nervisque hirtella, cæterum glabra, nervis lateralibus utrinque 7–8 subpatulis, supra impressis, subtus prominulis, venis transversis, supra quidem cum reticulatione gracili distinctis. Racemi *pauciflori*, ad 5 lin. longi, stricti, *ferrugineo-tomentosi*; bracteæ ovatæ, parvæ; pedicelli brevissimi, crassiusculi. Calyx *patellaris, ferrugineo-tomentosus*; lobi 10 sublineares, remoti, $\frac{1}{2}$ lin. longi. Petala nulla (?). Stamina 10; filamenta e basi triangulari subulatâ cum antheris minutis $\frac{1}{2}$ lin. longa. Drupa *ovoidea*, 4–$4\frac{1}{2}$ lin. longa, 3–$3\frac{1}{2}$ lin. lata, *sparse fulvo-pilosa.*

At 7800 feet (*Haviland*, 1118).

The habit is more like that of *P. Wightianum*, Blume, than of any other species; but the hairy and ovoid ovary is very different, and the true affinity lies rather with *P. capitellatum*, Hook. fil., and *P. montanum*, Hook. fil., from Tenasserim and Sikkim respectively.

Rubus glomeratus, Blume, Bijdr. 111.

At 6000 feet (*Haviland*, 1194); at Koung and Kiau (*Burbidge*).

Distribution: All over Malaya, from the Peninsula to the Philippines and to New Guinea.

RUBUS LINEATUS, Reinw. in Blume, Bijdr. 1103.

Pakapaka, alt. 10,500 feet, some 15 feet high, in jungle (*Haviland*, 1064).

Distribution: Malaya, from Sumatra to Borneo; East Himalaya, from Sikkim to Mishmi.

RUBUS LOWII, Stapf, in Hook. Ic. Pl. t. 2289. Rami *inermes*, teretes, nigrescentes, *pilis patulis tomentelli*, insuper setulis glanduligeris parce obsiti, tandem glabrati. Stipulæ lanceolatæ, integræ vel minute denticulatæ et basin versus glandulose fimbriatæ, parce hirsutæ vel glabratæ, circiter 3 lin. longæ. Folia digitata, trifoliolata, petiolo tomentello 7–10 lin. longo suffulta, foliola breviter petiolulata, *terminale* majus, ellipticum vel obovatum, magnitudine valde varians, ad $1\frac{3}{4}$ poll. longum, ad 10–11 lin. latum, basi plus minusve cuneatum, apice acutum vel breviter acuminatum, duplicato-serratum, supra nigricans, *nervis sericeo-pilosis, ut venulæ transversæ tenerrimæ plus minusve impressis*, subtus brunneum, nervis venulisque sericeo-pilosis; foliola *lateralia* omnino consimilia, sed utrinque obtusiora, plus minusve asymmetrica, quartâ vel tertiâ parte minora; *folia hinc inde ad foliolum solitarium, late rotundato-ovatum, indivisum vel plus minusve trilobum redacta*, nunc parva, $\frac{3}{4}$–1 poll. longa, nunc 2–3-plo majora. Flores *solitarii*, axillares. Pedicelli nutantes, tomentelli, $\frac{3}{4}$–1 poll. longi. Calycis segmenta ovata, $2\frac{1}{2}$–4 lin. longa, caudato-acuminata vel apice inciso-dentata, interiora extus in parte in alabastro segmentis exterioribus obtectâ dense et minutissime tomentella, cæterum ut hæcce pilis paucis longis conspersa, omnia intus griseo-tomentella. Petala rosea, late obovata subunguiculata, $2\frac{1}{2}$–3 lin. longa, apiculata. Stamina uniseriata. Syncarpium *siccum*, depresso-globosum, 4–5 lin. dimetiens; receptaculum ovoideum, dense sericeo-pilosum; achænia circiter 20, libera, oblique ovata, $1\frac{3}{4}$ lin. longa, glabra, *foveolato-reticulata*; stylus 2 lin. longus, glaber.

From 9000–13,000 feet (*Low*; *Haviland*, 1082).

A very distinct species, which approaches somewhat *R. alpestris*, Bl., from which it differs in the absence of prickles, the tomentum, the broader leaflets with impressed nerves, and the solitary flowers. The achenes of the only ripe fruit I have seen are perfectly free and covered with a very thin, hardly fleshy pericarp.

RUBUS ALPESTRIS, Blume, Bijdr. 1103.

At 7600 feet (*Haviland*).

Distribution: Malaya, in high elevations; temperate Himalayas, from Gurhwal to Sikkim, from 7000 to 10,000 feet.

I have seen only a branch without flowers or fruits, but this agrees so exactly with Horsfield's specimen from Mt. Prahu in Java that I do not hesitate to refer it to the same species. The Himalayan form constitutes a well-marked variety, characterized by the bristles on the calyx.

Rubus rosæfolius, Smith, Ic. ined. iii. t. 60; Miq. Fl. Ind. Bat. i. pt. 1, 375.

On the Kadamaian, alt. 2500 feet (*Haviland*, 1195); alt. 3000 feet (*Burbidge*).

Distribution: All over Malaya to New Guinea and South-east Australia; Indo-China, to the Khasia Hills and the temperate Himalaya; Japan; South Africa and Madagascar (introduced?).

R. rosæfolius is "cultivated around the upland villages of North Borneo near Kinabalu," according to Burbidge, as it is in many parts of the Tropics; whence it is very difficult to trace the original area.

Rubus fraxinifolius, Poir. Dict. vi. 242.

Near Kiau, alt. 3000 feet (*Low; Haviland*, 1376); on the northern slopes to 5000 feet (*Low*).

Distribution: Throughout the Malay Archipelago, from Java to the Philippines and to Tidor.

Potentilla leuconota, D. Don, Prodr. Fl. Nepal. 230.

——, var. borneensis, Stapf. Folia utrinque dense argenteo-sericea. Bracteolæ, sepala, petala, stamina 2–3-plo majora, cæterum simillima. Achænia paulo majora, magis elongata, sub apice sericeo-pilosa.

In crevices of the rocks, and on dry sheltered places from 11,000 to 13,000 feet (*Low; Haviland*, 1058).

Distribution (of species): Alpine Himalaya, east of Gurhwal to South-west China (Yunnan, Mt. Omeï); Borneo; New Guinea.

This plant is mentioned by Sir Joseph Hooker in his Fl. Brit. Ind. ii. pt. 2, 352, as found on Kinabalu, but referred to *P. leuconota*, D. Don, without any further remark. There is no doubt with regard to the extremely close affinity between the Himalayan and Bornean plants. But from the more complete material which is now in my hands it appears to me necessary to distinguish the latter from the former by the characters given above.

Sir F. v. Mueller indicates a variety "*papuana*" of the same species from the Owen Stanley Ranges and from Mt. Musgrave, from 8000 to 13,000 feet (Trans. Roy. Soc. Victoria, vol. i. pt. 2, 5). The specimen of it which I saw agrees perfectly with the Kinabalu plant in habit, except the poor inflorescences, whilst the flowers are intermediate between those from Kinabalu and from the Himalaya, and the achenes are glabrous and even more elongate than in the variety *borneensis*.

Potentilla Mooniana, Wight, Icon. t. 233.

——, var. kinabaluensis, Stapf. Folia basalia foliolis majoribus utrinque 16–20, supra glabris, subtus in nervis sericeis, in dentibus pilis longis patulis ciliatis, foliolis interpositis minutis, interdum suppressis. Bracteolæ sepalis angustiores, æquilongæ, integræ vel rarius minute tridentatæ. Achænia paululo majora, nervis prominulis.

In swampy, sheltered, sunny spots, at 11,000 feet (*Haviland*, 1056).

Distribution (of species): Ceylon; Himalaya, from Kumaon to Sikkim; Khasia Hills; Borneo.

This variety is much nearer to the Ceylon and the Khasia form than to that of the Himalaya, which constitutes a well-marked variety if not a species, and corresponds with Wallich's *P. polyphylla* (Cat. n. 1026, not n. 1030). Number 1030 of Wallich's herbarium is his *P. barbata* (=*P. polyphylla*, var. *barbata* Lehm. Revis. Potent. 54), and is identical with the Ceylon plant which was described as *P. Mooniana* by Wight. The specimen from Kinabalu is chiefly characterized by the numerous larger leaflets and the very small interposed ones, and by the long spreading hairs on their margin.

POTENTILLA PARVULA, Stapf, in Hook. Ic. Pl. t. 2293 (§*Polyphyllæ*, Lehm.). Caulis valde abbreviatus, parte epigæâ $\frac{1}{2}$–2 poll. longâ, inferne foliorum atque stipulorum residuis sericeo-lanatis dense vestitus, superne arcte foliatus, simplex vel brevissime parceque ramosus, apicem versus ramulos *unifloros* edens. Ramuli floriferi erecti, 1–2-foliati, 1–$1\frac{1}{2}$ *poll. longi*, pilis sericeis longis plus minusve patulis vestiti. Stipulæ petiolo ad $\frac{3}{4}$ adnatæ, oblongæ vel oblanceolatæ, 4–6 lin. longæ, $1\frac{1}{2}$–$2\frac{1}{2}$ lin. latæ, acutæ, scariosæ, extus sericeo-pilosæ, intus glabræ, in ramulis floriferis minores, plus minusve bilobæ vel bifidæ. Folia pinnatifida, rhachi ad $\frac{1}{2}$–1 poll., vel in speciminibus nanis et in ramulis floriferis tantum ad 1–3 lin. nudâ, patule sericeo-pilosâ, $\frac{1}{2}$–4 poll. longa, 4–8 lin. lata; foliola basin versus decrescentia, utrinque 10–12, in speciminibus nanis fere imbricata, sessilia vel breviter petiolulata, *rotundato-ovata*, superiora 2–3 lin. longa, $1\frac{3}{4}$–$2\frac{1}{4}$ lin. lata, *utrinque* 3–1-*dentata vel in latere basin versus spectante subintegra*, *denticulis ovatis obtusiusculis* (si pauca, semper sub ipso apice), rigidiuscula, demum castanea, supra glaberrima, nitida, infra in costulâ atque in margine pilis longis paucis obsita; in foliis longioribus sæpe foliola pauca minuta integra interjecta; folia caulis floriferi consimillima, plerumque valde redacta. Involucelli *bracteolæ rotundato-ellipticæ*, $1\frac{1}{2}$–$1\frac{3}{4}$ lin. longæ, obtusæ, ut *sepala* ovata, acuta, æquilonga, parce sericeo-pilosæ. Petala obovata, 2–$2\frac{1}{2}$ lin. longa, aurea. Stamina 10, *bina sub unoquoque petalo*. Torus dense sericeo-pilosus. Ovaria glabra, breviter oblique oblonga, stylo subbasali, superne leviter incrassato.

In boggy, sheltered, sunny places, alt. 11,000 feet (*Low*; *Haviland*, 1057).

P. parvula is nearest allied to *P. Mooniana*, Wight, and Dr. Haviland suggests that it might even be an extreme form of it.

STRANVÆSIA INTEGRIFOLIA, Stapf, in Hook. Ic. Pl. t. 2294. Frutex. Ramuli nigrescentes, novelli plus minusve tomentelli, demum glabrati, cortice plumbeo. Folia petiolo 4–6 lin. longo, supra canaliculato, rubescente, tomentello vel glabrato suffulta, elliptico-oblonga, 2–3 poll. longa, 10–12 lin. lata, basi breviter acuta, apice acuta vel subacuminata, rarius obtusiuscula, *margine integro*, supra nitida, in nervis pilosula, demum glabrata, subtus glabra, in margine primo minute lanuginosa, mox glabrata, coriacea, *nervis lateralibus* 7–9, *tenuibus, vix prominulis, valde obliquis*. Corymbi tomentelli, 20–30-flori. Pedicelli 1–2 lin. longi. Calyx turbinatus, tomentellus; tubus $1\frac{1}{2}$ lin. longus; lobi persistentes, triangulares, $\frac{1}{2}$ lin. longi, acuti. Petala rotundata, $2\frac{1}{2}$ lin. dimetientia, alba. Stamina circiter 20. Ovarium ad $\frac{1}{2}$ cum calycis tubo connatum, 5-loculare; styli 5 ad $\frac{3}{4}$ connati; stigmata apice incrassata,

truncata. Fructus (haud perfecte maturus) $2\frac{1}{2}$ lin. dimetiens, vertice hemisphærico, e tubo calycis exserto, leviter 5-sulcato.

From 11,500 to 13,000 feet (*Haviland*, 1071).

So closely allied to *Stranvæsia glaucescens*, Lindl., from the Himalaya and the Khasia Hills, that it might be almost considered as a variety of it. But the corymbs are stouter, denser, and less tomentose, and the leaves absolutely entire, with fewer and fainter nerves, which are curved more forward than is the case in *S. glaucescens*. A specimen of *S. Davidiana*, Decne., from Szechuen (*Henry*, 8953), comes also extremely near, but the lateral nerves are about twice as numerous and straighter.

SAXIFRAGACEÆ.

DICHROA FEBRIFUGA, Lour. Fl. Cochinch. 301.

Koung, alt. 2000 feet (*Burbidge*; *Haviland*, 1375).

Distribution: Malaya, from the Peninsula and Sumatra to Celebes and the Philippines; Indo-China to Mt. Omeï, Hupeh and Fokien; Burma, Khasia Hills and Himalaya to Nepal.

ITEA MACROPHYLLA, Wall. in Roxb. Fl. Ind. ii. [1824] 419.

In young jungle on the Ulu Tawaran, alt. 2000 feet (*Haviland*, 1368).

Distribution: Malaya, from Java to the Philippines; Khasia Hills and Eastern Himalaya.

POLYOSMA HOOKERI, Stapf, in Hook. Ic. Pl. t. 2296. Frutex. Ramuli novelli minute puberuli, mox glabrati, nigricantes, vetusti lenticellis pallidis obsiti. Folia opposita, petiolo 3–5 lin. longo, tereti suffulta, *obovata vel elliptica*, 1–$1\frac{1}{2}$ *poll. longa*, $\frac{3}{4}$–1 *poll. lata, interdum multo minora*, basi breviter acuta, apice obtusa, emarginata, margine anguste revoluta, *coriacea, glaberrima, nigricantia, supra lucida*, nervis lateralibus utrinque 4–6 angulo subrecto ortis. Inflorescentia terminalis, *brevissime cymuloso-racemosa, pauciflora*. Pedicelli 2–$2\frac{1}{2}$ lin. longi, puberuli, sub calyce 2–3-bracteolati. Bracteolæ lineari-lanceolatæ vel subulatæ, 1 lin. longæ. Calyx turbinatus, $1\frac{1}{2}$ lin. longus, puberulus, lobis triangularibus, 1 lin. longis, persistentibus. Petala *linearia vel lineari-lanceolata*, 1 *poll. longa, vix* $1\frac{1}{2}$ *lin. lata*, extus, imprimis basin versus, flavido-sericeo-tomentella, intus *rosea* villosula. Stamina 4; filamenta linearia, 6–7 lin. longa, villosula; antheræ lineares, vix 3 lin. longæ. Stylus 9 *lin. longus, glaber*; *stigma capitulatum*. Fructus niger, ellipsoideus, 4–5 lin. longus, calyce persistente coronatus, unispermus. Semen globoso-ellipsoideum; embryo minimus in imâ basi situs.

From 8000 to 10,500 feet, commonest at 10,000 feet (*Low*; *Haviland*, 1068).

A very distinct species, with large flowers.

POLYOSMA BRACTEOSUM, Stapf, n. sp. Frutex altus. Ramuli juniores *tomento denso flavido vestiti*, vetustiores nigricantes. Folia opposita vel subopposita, petiolo robusto, tomentello, $\frac{3}{4}$–1 poll. longo suffulta, elliptica, 3–$4\frac{1}{2}$ poll. longa, 2–$2\frac{1}{2}$ poll. lata, basi rotundata, apice obtusa, integra vel sub apice utrinque 1–2 denticulata, revoluta,

coriacea, supra primo tomentosa, mox glabrescentia, exsiccando nigricantia, lucida, subtus flavido-tomentosa, tomento tandem plus minusve evanido, nervis lateralibus utrinque 8–10, utrinque prominentibus, laxe reticulata. Racemi stricti, laxiusculi, *dense tomentosi*, ad 5 poll. longi; *bracteæ lineares circa* 5 *lin. longæ*; pedicelli brevissimi; bracteolæ bracteis consimiles. Calyx cupularis, 1½ lin. altus, tomentosus, lobis ovatis. Petala *fuscescentia, e basi ovatâ late linearia*, erecta, apice tantum patentia, 6 *lin. longa, supra basin* 1½ *lin. lata, extus et intus in parte superiore tomentosa.* Filamenta linearia, basi exceptâ papillis albis longiusculis vestita, 2–2½ lin. longa; antheræ lineares, 1½ lin. longæ. Stylus crassiusculus, cylindricus, 4 lin. longus, sericeo-pubescens; stigma minute bilobum. Fructus oblongo-ovoideus, tomentosus, 5 lin. longus. Semen solitarium, 3 lin. longum.

At 9000 feet, (*Haviland*, 1103).

Allied to *P. mutabile*, Blume, but distinct by its large flowers and bracts and the more copious tomentum.

DROSERACEÆ.

Drosera spathulata, Labill., Pl. Nov. Holl. i. 79, t. 106, f. i.

Maripari Spur, from 5000 to 5500 feet (*Low*, *Haviland*).

Distribution: South-east China, Borneo, Philippines; East Australia from Queensland to Tasmania; New Zealand.

I am not able to distinguish the Chinese form which has been described as *D. Loureiri*, Hook. et Arn. (Bot. Beech. Voy. 167, t. 131) from the Australian *D. spathulata*, and consider it to be quite the same plant, as Bentham has already suggested (Fl. Austral. ii. 459).

HALORAGINEÆ.

Haloragis micrantha, R. Brown in Flinders's Voy. ii. 550.

In clefts on rocks and open places, in compact tufts, alt. 12,000 feet (*Haviland*, 1077).

Distribution: From Australia and New Zealand to Japan, Indo-China, and the Sikkim Himalaya.

MYRTACEÆ.

Leptospermum recurvum, Hook. fil. in Hook. Ic. Pl. t. 893.

From 7000 to 13,000 feet, commonest above 11,000 feet (*Low; Haviland*, 1063).

A shrub, 4–8 feet high below 11,000 feet, but dwarf, a few inches only in height, at the top of the mountain, which appears quite white with it when in blossom.

Leptospermum javanicum, Blume, Bijdr. 1100.

A small spreading tree, at 7700 feet (*Haviland*, 1154).

Distribution: Malaya; Moulmein.

The specimens from Kinabalu exactly agree with the plant collected by Lobb on Mt. Thounggyen in Moulmein. They differ slightly from the Sumatran and Javan plant

in the less stout habit, the thinner leaves, and the much scantier indumentum of the calyx. The difference between *Leptospermum javanicum* and *L. recurvum* is not greater than that between typical *L. flavescens*, Sm., and some forms referred to var. *obovatum* of this species. The amount of hairiness in *L. recurvum* is exceedingly variable, and plants growing close to each other may possess either leaves with a dense white silky coat on the back or leaves almost without hairs. The same may be said with regard to the calyx. Thus the difference is reduced to the stunted habit and the minute leaves. Such minute leaves, however, may be found occasionally also in *L. javanicum*, at the base of the branches or on short and poorly developed lateral shoots. This form of leaves evidently has become general in *L. recurvum*, whilst the texture grew firmer at the same time and the margins recurved, as often occurs in similar cases with alpine or very exposed forms.

Decaspermum Vitis-Idæa, Stapf, n. sp. (Pl. XI. a. figs. 1–9.) Fruticulus. Rami graciles, dense foliati, cinereo- vel subnigro-strigillosi, demum glabrati, vetusti cortice brunneo. Folia opposita, petiolo brevissimo suffulta, *oblonga*, 3–4 *lin. longa*, 2 *lin. lata, basi et apice obtusa, margine revoluto*, coriacea, supra, costulâ sericeâ exceptâ, glabra, impresso-punctata, mox glaberrima, lucida, subtus in costulâ et in marginibus longe argenteo-sericeo-pilosa demum plus minusve glabrata, minute nigro-punctulata, evenia. Flores *axillares*, pedicellis 2–2½ lin. longis apice bibracteatis sericeo-pilosis suffulti. Calycis tubus turbinatus, argenteo-sericeus; lobi 4, triangulares vel ovati, obtusi vel subacuti, 1 lin. longi. Petala 4, alba, purpureo-suffusa, obovato-rotundata, ad 2 lin. longa, in margine minute ciliolata. Stamina numerosa, sub 3-seriata, in alabastro incurva; filamenta petala vix æquantia; antheræ minutæ, subglobosæ, loculis longitudinaliter dehiscentibus. Ovarium 5-loculare; stylus filiformis, pilosulus; stigma minute capitatum; *ovula solitaria, fere e basi erecta*. Bacca (immatura) subglobosa, parva; semina 5, reniformia.

Maripari Spur, alt. 5500 feet (*Haviland*, 1261).

A very distinct species, characterized by the small oblong leaves and the solitary ovules. Young leaves are sometimes very like the minute leaves which now and then occur in *Decaspermum paniculatum* amongst the normal ones, or like those of *D. Blancoi*, Vidal, to which the species is nearest allied; but they soon become much firmer, whilst the margins curl in, and then they resemble very much those of *Vaccinium Vitis-Idæa*. I found the ovules always solitary, rising from a little above the base of the cell. Nevertheless, the back of the cell may sometimes be seen intruding slightly into the cell, forming a faint central ridge, thus indicating the formation of a false septum, which is more or less normal in other species of *Decaspermum*.

Decaspermum paniculatum, Kurz, in Journ. As. Soc. Beng. xlvi. (1877) part ii., 61.

At Koung, alt. 2000 feet (*Haviland*).

Distribution: Throughout Malaya, from the Peninsula to the Philippines and New Guinea.

MYRTUS FLAVIDA, Stapf, in Hook. Ic. Pl. t. 2290. Arbor *parva vel frutex, ramis divaricatis.* Ramuli novelli plus minusve dense albo-villosi, vetustiores cortice nigricante vel griseo. Folia opposita, patula vel reflexa, petiolo $\frac{1}{2}$–$\frac{3}{4}$ lin. longo suffulta, ovato-lanceolata, 9 lin. longa, 2–3 lin. lata, basi rotundata, obtusa vel subacuminata, acumine obtuso, marginibus plus minusve revolutis, coriacea, supra nitidula, primo villosula, mox glaberrima, subtus densius atque diutius villosa (imprimis in costâ) et glanduloso-punctulata, nervis lateralibus 2 subbasalibus sub margine fere ad apicem ductis, cæteris subrectis, supra tantum visibilibus et ut priores levissime impressis. Flores axillares, solitarii vel 2–3 fasciculati. Pedicelli villosi, $\frac{1}{2}$–2 lin. longi, vel subnulli. Calycis tubus turbinatus, 1 lin. longus, villosus; lobi 4, suberecti, post anthesin conniventes, vix tubo breviores, triangulares. Stamina numerosa, biseriata; filamenta in alabastro, interiora quidem, inflexa, in flore aperto 2–3 lin. longa; antheræ basi affixæ, rotundato-ovatæ, $\frac{1}{4}$ lin. longæ. Stylus filiformis; stigma punctiforme. Ovarium biloculare; placentæ paulo prominulæ; ovula in utroque loculo circa 10–14, biseriata. Fructus baccatus, calyce persistente coronatus, globosus, $1\frac{3}{4}$–2 lin. dimetiens, niger. Semina arcte compressa, 10–12 in utroque loculo, subreniformia, angulata, pallida, testâ crassiusculâ durâ. Embryo a me non visus, sed cavitas seminis curvata, angusta.

Maripari Spur, alt. 5500 feet; alt. 7700 feet (*Haviland*, 1155).

This is a very remarkable species. It is the first *Myrtus* found in the Archipelago. The habit is almost that of certain South-American species, as *M. myricoides*, H. B. K., or *M. microphylla*, Humb. et Bonpl. One specimen with very small and very revolute leaves comes more closely to *M. rufo-punctatus*, Brongn. et Gris, from New Caledonia, whilst the nearest ally among the Australian species is perhaps *M. Metrosideros*, Baill., from Mount Bellenden Ker in Queensland, a plant which is known only from barren branches.

TRISTANIA ELLIPTICA, Stapf, n. sp. (§ *Eu-Tristania*). (Pl. XI. D. figs. 14–17.) Frutex humilis. Ramuli nigricantes, crassiusculi, glaberrimi, demum cortice irregulariter soluto, pallidiores. Folia alterna vel summa opposita, *approximata*, petiolo latiusculo circa 1 lin. longo suffulta, *elliptica vel obovata*, $1\frac{1}{2}$–$2\frac{3}{4}$ poll. longa, 1–$1\frac{3}{4}$ poll. lata, basi petiolum acutata, *apice obtusa vel obtusissima, valde coriacea, glaberrima*, supra lucida, subtus opaca, costâ supra impressâ, subtus crassiusculâ prominente, nervis lateralibus supra prominulis, utrinque 15–18, 2 lin. inter se distantibus, parallelis, rectis, sub ipso margine cum nervo marginali junctis, venulis supra interdum prominulis laxe reticulantibus. Cymæ *terminales et axillares, breves, congestæ, pedunculo vix $\frac{1}{2}$ poll. longo* suffultæ, bracteatæ, glabræ. Bracteæ ovatæ, $\frac{1}{2}$–$\frac{3}{4}$ lin. longæ, valde caducæ. Pedicelli 1–$1\frac{1}{2}$ lin. longi vel vix ulli. Calyx depresso-turbinatus, 1–$1\frac{1}{2}$ lin. longus, dentibus brevibus triangularibus, extus glaber, intus minute albido-tomentellus. Petala obovata, transverse latiora, vix $\frac{1}{2}$ lin. longa. Stamina circa 15; filamenta terna ad medium connata, exteriora cujusque fasciculi breviora. Ovarium subsuperum, 3-loculare, globosum, villosulum; stylus e calycis tubo paulo exsertus; ovula reflexa, numerosa. Capsula *subglobosa, imâ tantum basi calycis tubo adnata, exserta,* ad 2 lin. longa. Semina 6–8 in quoque loculo, $\frac{1}{2}$ lin. longa, alâ oblongâ fere triplo longiore.

Maripari Spur, alt. 5500 feet (*Haviland*, 1257).

Very distinct by the crowded and very coriaceous, mostly broad-elliptic leaves, and the robust and short inflorescences. The capsule is of the same size as in *Tristania Wightiana*, Griff., or *T. burmanica*, Griff. The nearest allied species which I have seen is represented by a specimen (still undescribed) collected by Beccari in Sarawak (no. 2224).

TRISTANIA BILOCULARIS, Stapf, n. sp. Frutex. Ramuli novelli glaberrimi, nigricantes, vetustiores cortice pallido vestiti. Folia alterna vel summa subopposita, petiolo 3–5 lin. longo suffulta, obovato-oblonga, $1\frac{1}{2}$–2 poll. longa, $\frac{3}{4}$–1 poll. lata, *cuneatim in basin attenuata*, obtusa, *marginibus revolutis*, coriacea, glaberrima, supra subnitida, subtus opaca, nervis secundariis utrinque circa 12–15, $1\frac{1}{2}$ lin. inter se distantibus, indistinctis, marginalibus sub ipso margine vix visibilibus. Cymæ *paucifloræ*, terminales vel axillares, *pedunculo* 2–3 *lin. longo*. Pedicelli 1 lin. longi, glabri. Calyx depresso-turbinatus, 1 lin. longus, dentibus minutis triangularibus, intus minutissime tomentellus. Capsula *elongato-globosa valde exserta*, imâ tantum basi calycis tubo adnata, vix $1\frac{1}{2}$ lin. longa, septicidè *bivalvis*. Semina 2 *in utroque loculo*, pendula, $1\frac{1}{2}$ lin. longa, elliptica, superne alata.

At 6600 feet (*Haviland*, 1199).

I have not seen the flowers of this species; yet the scars left by the stamens between the calyx-teeth show even in the mature state the three vascular bundles of each staminal bundle. The capsules are smaller than in *T. Wightiana*, Griff., to which it is perhaps more nearly allied than to any other species.

EUGENIA KINABALUENSIS, Stapf, n. sp. (§ *Syzygium*). (Pl. XI. B. figs. 10–12.) Frutex. Ramuli novelli tetragoni, vetustiores teretes, cortice brunneo in lacinias angustas longas soluto. Folia superne valde approximata, petiolo vix 1 lin. longo suffulta, rotundato-ovata vel orbicularia, 4–6 lin. longa, 3–6 lin. lata, basi rotundata, apice valde obtusa vel subemarginata, marginibus revolutis, coriacea, supra opaca, subtus sublucida, pallidiora, glaberrima, costâ supra impressâ, tenui, *nervis lateralibus tenuissimis* 6–8, *supra tantum plus minusve distinctis*. Cymæ terminales, paucifloræ, breves, vix e foliis exsertæ. Calycis (juvenilis) tubus breviter *subcylindricus*, $1\frac{1}{4}$ lin. longus; lobi 4 ovati, $1\frac{1}{4}$ lin. longi. Petala libera, elliptica vel rotunda, 1 lin. longa. Ovarium 3-loculare; ovula numerosa in quoque loculo.

At 8800 feet (*Haviland*, 1112).

This, like the following species of *Eugenia*, is not represented in a quite complete state in Dr. Haviland's collection. I should therefore have refrained from describing them as new species if they had not been of so characteristic a type that I could not have overlooked them in going through the material in the Kew Herbarium and through the descriptions of those comparatively few species of tropical Asia which are not represented in our collections. *E. kinabaluensis* has quite the habit of *E. rotundifolia*, Wight, from which it may be distinguished by the very indistinct and looser venation of the leaves, and the longer, more cylindrical calyx. The difference in the venation, however, is only one of degree, as the lateral nerves in *E. kinabaluensis* are hardly less numerous; but they are alternatively so faint that they do not count.

EUGENIA AMPULLARIA, Stapf, n. sp. (§ *Syzygium*). (Pl. XI. c. fig. 13.) Frutex. Ramuli subteretes, brunnei, rami crassi, albescentes. Folia *valde approximata*, petiolo crassiusculo nigrescente 1 lin. longo suffulta, *rotundato-ovata, ad* 1–1½ *poll. longa*, 10–14 *lin. lata*, basi late rotundata, apice subacuta vel obtusa, in margine paulo recurva, coriacea, *supra lucida nigrescentia, subtus opaca pallide olivacea*, glaberrima, costâ supra impressâ, nervis lateralibus utrinque 15–20, angulo fere recto ortis, rectis, *utrinque prominulis*, imprimis subtus conspicuis, nervo marginali sub ipso margine ad apicem ducto, venulis plus minusve conspicuis, laxe anastomosantibus. Cymæ terminales, paucifloræ, *brevissimæ, vix e foliis exsertæ, robustæ*. Fructus *globosus*, 5–6 *lin. dimetiens, calycis tubo persistente* 3 *lin. longo basi constricto coronatus*. Semen solitarium, globosum, 3 lin. dimetiens; cotyledones crassissimi, hemisphærici, subinæquales.

At 11,500 feet (*Haviland*, 1096).

E. ampullaria is closely allied to a species collected by Thwaites on Adam's Peak and erroneously referred by him and Duthie to *E. calophyllifolia*, Wight, a plant represented in the Kew Herbarium from the Western Peninsula only. This is distinguished chiefly by the larger fruits, which are (immature) 5–6 lin. long and bottle-shaped, with but a slight constriction at the neck. The part below the constriction is obovoid, tapering into the base, that above cylindric and suddenly widened into the margin, which is minutely toothed or almost entire. All the fruits of the Ceylonese specimen are immature, but in one or two which are more advanced the lower part is almost globose, thus approaching the shape of the fruit of *E. ampullaria*. The inflorescence is also of the same character as in the Ceylonese plant mentioned, which is now *E. Fergusoni*, Trim., but, like all other parts, much stouter. The leaves of *E. Fergusoni* are also very similar, but smaller and not glossy, and their veins are not prominent above.

EUGENIA MYRTILLUS, Stapf, n. sp. (§ *Syzygium*). Frutex. Ramuli quadranguli, rami cinerei, graciles, plus minusve teretes. Folia approximata, petiolo 2–2½ lin. longo suffulta, *oblongo-lanceolata*, ¾–1¼ *poll. longa*, 4–6 *lin. lata, cuneatim in petiolum attenuata, obtuse acuminata vel obtusa*, margine tenuiter recurvo, glaberrima, coriacea, utrinque opaca, subtus pallidiora, nervis lateralibus primariis utrinque 10–12, 1–3 tenuioribus ante nervum marginalem evanidis interjectis, omnibus plus minusve parallelis, utrinque prominulis, subtus magis distinctis. Cymæ terminales, breves, graciles, 10–20-floræ, pedunculo 3–5 lin. longo suffultæ, minute bracteatæ. Calyx (juvenilis) *obconicus, subangustus*, 1½–2 *lin. longus, lobis* 4 *brevibus*, ovatis.

At 8800 feet (*Haviland*, 1109).

Nearest allied to *E. cuneata*, Wall., and *E. rubicunda*, Wight. The leaves come pretty near to those of *E. rubicunda* in venation and form, but they are smaller and comparatively broader. The inflorescence and the young flowers, on the other hand, agree rather with those of *E. cuneata*, Wall.

MELASTOMACEÆ.

MELASTOMA DECEMFIDUM, Roxb., Cat. Hort. Beng. 90.

Maripari Spur, from 5000 to 5500 feet (*Haviland*, 1267).

Distribution: Throughout Malaya; on the continent to Moulmein and to South-east China.

MELASTOMA BECCARIANUM, Cogn. in DC. Monogr. vii. 356.

At Kiau, on the Tampassuk River, alt. 3500 feet (*Haviland*, 1277).

Distribution: North Borneo.

I have not seen the type, but Dr. Haviland's specimens, as well as some collected by Lobb near Bruni, Sarawak, belong evidently to this species. The shape of the leaves is very uniform, but they are sometimes almost smooth, and sometimes very rough from short and stiff bristles. The indumentum of the calyx consists of numerous thick processes with long fulvous hairs, which are more or less interwoven and form thus a thick coat.

BLASTUS COGNIAUXII, Stapf, in Hook. Ic. Pl. t. 2311.—Syn. *Ochthocharis parviflora*, Cogn. in DC. Monogr. vii. 481.

Penokok, from 4000 to 6000 feet (*Haviland*, 1280).

Distribution: North Borneo.

The same plant was collected by Dr. Haviland on Mount Matang, at Selabut, and at Sepudang, Sarawak. It is a true *Blastus*.

ANERINCLEISTUS CORDATUS, Stapf, in Hook. Ic. Pl. t. 2310. Fruticulus (?). Caulis superne dense fulvo-tomentellus. Folia petiolo $1\frac{1}{2}$–$3\frac{1}{2}$ poll. longo fulvo-tomentello suffulta, *late subcordato-ovata, ad* 9 *poll. longa, ad* 6 *poll. lata*, basi leviter cordata, sinu angustissimo, apice breviter caudato-acuminata, integra, membranacea, supra in nervis fulvo-tomentella, præterea setulis minutis fulvis aspersa, nigrescentia, infra pallida, in nervis dense, in venulis laxius tomentella, 7–9-nervia, venis transversis 2–3 lin. inter se distantibus rectis vel subflexuosis, in margine tenuiter ciliatula. Panicula terminalis pedunculo 4 poll. longo suffulta, 6 poll. longa, tota fulvo-tomentella. Flores 4–1 ad ramulorum secundi ordinis apices umbellatim congesti, pedunculo ad $2\frac{1}{2}$ lin. longo vel brevissimo suffulti. Pedicelli circiter 1 lin. longi. Calyx *turbinatus* $1\frac{1}{2}$ *lin. longus*, 4-dentatus, dentibus brevissimis, latis, obtusis, persistentibus, fulvo-tomentellus. Petala alba, rhomboidea, acuta, 1 lin. longa. Stamina 8, *subæqualia*; antheræ majores sublineares, incurvæ vel subrectæ, $1\frac{1}{2}$ lin. longæ, basi longiuscule bilobæ, obtusæ, *utrinque inappendiculatæ*, minores lineares, vix 1 lin. longæ, brevius bilobæ. Ovarium lamellis angustis ad $\frac{2}{3}$ cum calycis tubo connectum, vertice coronula quadriloba, lobis emarginatis, ornatum; stigma punctiforme. Capsula turbinata, $1\frac{3}{4}$ lin. longa, quadrivalvata; valvæ triangulares, emarginatæ.

Penokok, alt. 3500 feet (*Haviland*, 1281).

Distribution: North Borneo.

This plant was collected by Dr. Haviland in Sarawak. It is closely allied to *A. Beccarii*, Cogn., but it differs in its broader leaves and somewhat larger flowers, with a more slender calyx. The anthers are in neither species spurred at the back, as is the case in *A. hirsuta*, Korth., *A. Helferi*, Hook. fil., and in *A. Griffithii*, Hook. fil. In *A. Beccarii* also the anthers are not quite equal, and are partly purple, partly yellow; but I doubt whether the

latter character is constant. In a specimen of *Anerincleistus Beccarii* from Mt. Matang, collected by Dr. Haviland, all the ramifications of the panicle are supported and enveloped in a young state by densely tomentose ovoid or ovoid-lanceolate bracts, which very soon come off. In the specimen of *A. Havilandii*, the scars of bracts are still to be seen on the panicle, and it seems to me very likely, from their shape and size, that the bracts are also of a similar kind.

DRIESSENIA GLANDULIGERA, Stapf, in Hook. Ic. Pl. t. 2291. Herba 4 ped. alta. Caulis obtuse quadrangularis, *setulis plerumque glanduligeris patulis* obsitus. Folia *petiolo* 2–3½ *poll. longo* indumento caulis consimili induto suffulta, *cordato-ovata*, 4–6½ poll. longa, 2–3 poll. lata, basi sinu angusto cordata, apice breviter acuminata, margine ciliata, membranacea, *supra setulis brevibus adpressis paucis* aspersa, *cæterum glabra*, subtus in nervis setis sæpe glanduligeris patulis et præterea pilis minutissimis plus minusve adpressis glanduligeris vestita, 7–9-*nervia*, venis transversalibus angulo fere recto ortis, anfractis, distinctis, tenuiter reticulata. Paniculæ axillares a basi ramulosæ, *bracteatæ*, circiter 1 poll. longæ, *dense glandulose setulosæ*, floribus ad ramulorum apices plerumque 3. Bracteæ *ovatæ vel lanceolatæ vel lineares*, plerumqe parvæ. Pedicelli 1 lin. longi. Calyx breviter turbinatus, roseus, 1¼–1½ lin. longus, *dentibus* 4 *subulatis*, setis patulis glanduloso-capitatis laxe vestitus. Petala alba, late ovata, 2½ *lin. longa*, acuta. Stamina 8, æqualia; antheræ aureæ, lineares, obtusæ, basi antice appendicibus binis filiformibus flexuosis, postice calcare simili sed breviore auctis. Ovarium ad medium cum calyce connatum, in vertice coronulâ breviter 4-lobâ, pyramidatâ ornatum; stylus flexuosus; stigma punctiforme.

At 5000 feet (*Haviland*, 1174).

See the remarks under the following species.

DRIESSENIA MICROTHRIX, Stapf, in Hook. Ic. Pl. t. 2292. Caulis superne obtuse quadrangularis, inferne teres, *ut tota planta pilis minutissimis apice plerumque glanduligeris obsitus*. Folia *petiolo* 3–4 *lin. longo* suffulta, *valde asymmetrica, ovato-oblonga*, 8–9 poll. longa, 2½–3 poll. lata, basi subrotundata, longe in acumen obliquum attenuata, integerrima, membranacea, fere concoloria, *utrinque sub lente valido minutissime pilosula*, 5-*nervia*, venis transversalibus angulo fere recto ortis, subrectis, 3–5 lin. inter se distantibus. Inflorescentia racemoso-cymosa, ab imâ basi ramosa ideoque plus minusve fasciculata, axillaris, 3–4 lin. longa, pedicellis gracilibus, 1–1½ lin. longis. Calyx cupularis, ½–¾ lin. longus, *dentibus minutis, inconspicuis, latissimis, obtusis*, persistentibus. Petala alba, late rotundato-ovata, obtusa, ½–¾ *lin. longa*. Stamina 8, subæqualia; antheræ lineares, ½–¾ lin. longæ, obtusæ, basi antice appendiculis binis ¼ lin. longis subfiliformibus auctæ, postice breviter calcaratæ. Ovarium ad ⅓ calyci adnatum, vertice coronulâ pyramidatâ, breviter quadrilobâ, persistente coronatum; stylus subflexuosus; stigma punctiforme. Capsula e calyce persistente exserta, 1–1¼ lin. longa, 4-valvis.

Penokok, alt. 3500 feet (*Haviland*, 1279).

The two species of *Driessenia* described here have the anthers almost or quite equal;

they are linear and obtuse, not rostrate, as in *Driessenia axantha*, Korth. Otherwise they agree in all essential points with the generic characters of *Driessenia*. The very minute glandular hairs, which are dispersed over both surfaces of the leaves in *D. microthrix*, may be also found in *D. glanduligera* and *D. axantha*, but in a very limited number and only along the nerves. They consist of a stalk, formed by 3–5 cylindric cells, and of an ovoid or globose, slightly enlarged terminal cell, which secretes a viscid matter. In *D. glanduligera*, all parts of the plant are provided with small gland-bearing bristles, which are homologous to those on the coronula of the ovary of *D. axantha*, though these are rather reduced and very few in number.

SONERILA TENUIFOLIA, Blume, in Flora, 1831, p. 491.

Penokok, alt. 3500 feet (*Haviland*, 1283); at 6000 feet (*Low*).

Distribution: Malaya, from Sumatra and Malacca to Borneo.

SONERILA CRASSIUSCULA, Stapf, n. sp. Herba monocarpica, basi lignescens, 7–9 poll. alta, interdum a basi ramosa. Caulis setulis crassiusculis adpressis plus minusve dense vestitus. Folia *inæqualia, majora* pedunculo $1\frac{1}{2}$–2 lin. longo suffulta, *ovato-oblonga, basi acuta vel subrotundata,* apice acuta, argute serrata, *crassiuscula,* supra viridia, costulâ setulis adpressis obsitâ exceptâ glaberrima, subtus purpurascentia vel intense purpurea, in nervis et in parenchymate setulis brevibus crassiusculis arcte adpressis vestita, 3-*nervia,* nervis subtus tantum conspicuis; *minora* multo brevius pedicellata, *ovata vel subrotunda, basi interdum subcordata,* 2–3 lin. longa. Cymulæ 2- vel 1-floræ, plerumque ad ramorum apices, pedunculo gracili glabro 3–6 lin. longo suffultæ; pedicelli $2\frac{1}{2}$–4 lin. longi, sub anthesi graciles, demum incrassati, glaberrimi. Calyx breviter tubuloso-campanulatus, 2 lin. longus, glaberrimus, dentibus late obtuseque triangularibus, $\frac{1}{2}$ lin. longis. Petala rosea (exsiccata alba), late obovato-elliptica, $4\frac{1}{2}$–5 lin. longa. Stamina 3; antheræ e basi bilobæ, ovatæ, acuminatæ, $2\frac{1}{2}$–3 lin. longæ. Capsula turbinata, $3\frac{1}{2}$ lin. longa, ut in *S. tenuifolia*.

At 9000 feet (*Haviland*, 1173); *Burbidge*.

Nearest allied to *S. tenuifolia*, Blume, with which it has much in common, particularly in the shape and structure of the flower and of the capsule. The thick, almost fleshy leaves exhibit the same sharp serrature, and where the base is rounded or, in the smaller leaves, subcordate, a 4th or 5th basal nerve may be seen, although these nerves are always very faint. The leaves of each pair are—except on the uppermost internodes—very asymmetric, but a tendency towards this may be observed also in *S. tenuifolia*.

SONERILA KINABALUENSIS, Stapf, n. sp. Herba monocarpica, subsimplex, 7–8 poll. alta. Caulis herbaceus, purpurascens, quadrangularis, minute pubescens et præterea parce pilis minutis plerumque glanduligeris aspersus. Folia æqualia vel subæqualia, petiolo purpurascente, $\frac{3}{4}$–1 poll. longo suffulta, ovato-oblonga, $1\frac{1}{2}$–3 poll. longa, $\frac{3}{4}$–1 poll. lata, *basi late rotundata,* interdum *cordata sinu brevissimo angusto,* apice sensim acuminata, minute crenulata, tenuia, utrinque minutissime verruculosa, supra glabra, subtus in nervis venulisque necnon in parenchymate pilis minutissimis

papilliformibus aspersa, 7*plo-nervia, duobus nervorum paribus infimis sub ipsâ basi oppositis, nervis tertii paris altioribus et plerumque alternis*, venis angulo 50° ortis valde prorsus ductis, nervis venisque purpurascentibus. Cymulæ circinoideæ, sub anthesi subumbellatim contractæ, terminales, interdum in ramulo valde abbreviato ideoque specie axillares; pedunculus gracilis 1–2 poll. longus, purpurascens, indumento caulis consimili sed parciore vestitus; pedicelli 1–2 lin. longi, superne incrassati. Calyx obconicus, 2–2½ lin. longus, dentibus late triangularibus, brevibus, minutissime puberulus et parce glanduloso-setulosus. Petala rosea, oblonga, 4 lin. longa, acuta. Stamina 3; antheræ e basi ovatâ bilobâ acuminato-rostratæ, 3–3½ lin. longæ.

In young jungle, at 3200 feet (*Haviland*, 1282).

Nearest allied to *S. picta*, Griff., from which it chiefly differs in the shape and the nervation of the leaves. On one of the leaves there are a few small white patches along the midrib, indicating the tendency to becoming variegated, which is the rule in *S. picta*, Griff.

Sonerila pulchella, Stapf, n. sp. Herba monocarpica, subsimplex, ascendens, 3–4 poll. alta. Caulis subteres, dense minuteque furfuraceo-puberulus, præterea setulis glanduligeris parce obsitus, rufescens. Folia subæqualia, petiolo ¼–¾ poll. longo suffulta, *ovata*, 1–2 poll. longa, ¾–1 poll. lata, *basi rotundata vel acuta, apice obtusa*, minute setuloso-serrulata, tenuia, utrinque minutissime verruculosa, supra viridia, secundum nervos albo-variegata, costulâ parce furfuraceo-puberulâ exceptâ glabra, subtus in nervis venulisque necnon in parenchymate furfuraceo-puberula, 5–7plo-nervia, venis plerumque inconspicuis. Cymulæ circinoideæ, sub anthesi umbellatim congestæ, terminales; pedunculus ½ poll. longus; pedicelli 2–3 lin. longi, demum incrassati. Calyx anguste obconicus, 2½ lin. longus, indumento caulis consimili vestitus, dentibus brevibus, late triangularibus, acutis. Petala rosea, obovato-oblonga, 3½ lin. longa, acuta. Stamina 3; antheræ e basi ovatâ bilobâ rostrato-acuminatæ (?). Capsula obpyramidata, trigona, 3 lin. longa, lævis, puberula vel glabrata.

At 6000 feet (*Haviland*, 1200).

This species is still more closely allied to *S. picta*, Griff., from which it differs solely in the shape of the leaves. I have seen only a single anther, and this was broken in the middle. The basal portion, however, was exactly of the same shape as in *S. picta*.

Sonerila maculata, Roxb. Fl. Ind. i. [1820] 180.

——, var. glabrata, Stapf, var. n. Folia subglabra, minute denticulata, non ciliata.

On the Tawaran River, alt. 2500 feet (*Haviland*, 1284).

Distribution (of species): From Nepal and the Khasia Hills to Upper Assam; Borneo.

Dr. Haviland's specimens, which are mere dwarfs, agree perfectly with *S. maculata*, Roxb., except in the characters mentioned above.

As the numerous specimens of Roxburgh's *S. maculata* which I have seen show a great uniformity in the ciliate denticulation of their leaves, I thought it expedient to distinguish the Bornean form as a variety, though on otherwise trifling characters.

SONERILA BORNEENSIS, Cogn. in DC. Monogr. vii. 509.

——, var. SETULOSA, Stapf, n. var. Folia breviora, latiora, tenuiora, supra setulosa, subtus in nervis adpresse hirsuta.

At 3000 feet (*Haviland*, 1285).

I have not seen the type of this species, but I believe that I recognize it in several specimens collected by Dr. Haviland near Kuching.

The plant from Kinabalu differs in the characters indicated above; yet the specimens from Kuching show a considerable variability in the shape of their leaves, which brings them in one specimen very near to the variety *setulosa*. The indumentum is also exactly of the same kind, but it is much scantier and there are hardly any bristles on the upper surface of the leaves. The species approaches closely *S. Beccariana*, Cogn.

PHYLLAGATHIS UNIFLORA, Stapf, in Hook. Ic. Pl. t. 2280. Herba monocarpica, lignescens, e basi ramosa, 6–9 poll. alta. Ramuli novelli dense rufo-hirsuti, demum glabrescentes, pallidi, subteretes. Folia *valde inæqualia, majora* petiolo 3–4 lin. longo dense rufo-hirsuto suffulta, *oblongo-lanceolata*, 1–1½ poll. longa, ½ poll. lata, basi acuta vel rotundata, apice acutiuscula vel subobtusa, a medio in margine minute serrata, firmula, supra obscure viridia, *secundum costam utrinque* 3–5 *setulis adpressis uniseriatis obsita*, præterea pilis minutissimis, primo dense, deinde laxissime vestita, infra pallida, in nervis adpresse rufo-hirsuta, in venis venulisque et partim in parenchymate pilis minutissimis rufis conspersa, 5plo-nervia, pare nervorum infimo sæpe tenui et indistincto; *folia minora* majoribus consimillima, sed multo minora vel minima, brevissime petiolata. Flores *solitarii in axillis foliorum, raro terminales*; pedicelli crassiusculi, 1½–1 lin. longi, basi bibracteati. Calycis tubus breviter subcampanulatus, subtetragonus, 2 lin. longus, parce pilis minutissimis rufis conspersus; *limbus 4-lobus deciduus; lobi e basi triangulari lineares subulati, falcato-recurvi*, 1½ lin. longi. Petala rosea, obovata, acuta, 4 lin. longa. Stamina 8, æqualia; filamenta 1¼ lin. longa; antheræ lineares, 1–1¼ lin. longæ, obtusæ, basi antice minute bilobæ, inappendiculatæ, connectivo postice in calcar breve abeunte. Ovarium subglobosum, ad ⅓ calyci adnatum, in vertice coronulâ obpyramidatâ, tetragonâ ornatum; stylus 3 lin. longus; stigma punctiforme. Capsula subhemisphærica, obtuse tetragona, 2–2½ lin. longa, glaberrima, albida, valvulis breviter bilobis. Semina oblique ovato-oblonga, ⅙ lin. longa, granulata, nitidula; hilum basilare; raphe tenuis lateralis.

At 6000 feet (*Haviland*, 1172).

See the remarks under the following species.

PHYLLAGATHIS ELLIPTICA, Stapf, in Hook. Ic. Pl. t. 2279. Herba monocarpica, erecta vel e basi repente radicante ascendens, 3–5 poll. alta. Caulis quadrangularis, superne dense hirsutiusculus, et imprimis ad nodos setis longis, pallidis, flexuosis vestitus. Folia *æqualia vel subæqualia*, petiolo ¼–½ poll. longo, indumento caulis consimillimo vestito suffulta, *elliptica, obovata vel oblonga*, 2–3½ poll. longa, 1¼ poll. lata, basi rotundata, obtusa, minute denticulata, supra primo villosa, demum glabrata, subtus in nervis venulisque adpresse hirsuta, 5–7-nervia. Cymuli 2–3-*flori, sub-*

sessiles, terminales vel axillares; *pedunculus crassiusculus, brevissimus*, bibracteatus. Bracteæ ovatæ, 2–3 lin. longæ. Pedicelli graciles, 8–9 lin. longi, glaberrimi, demum incrassati. Calyx breviter campanulatus, $1\frac{1}{4}$ lin. longus, glaber, minute verruculosus; *limbus deciduus*, 4-lobus; *lobi ovato-lanceolati, falcato-recurvi*, vix 1 lin. longi, apicem versus setulis paucis ciliati. Petala rosea, oblonga vel obovata, 5 lin. longa. Stamina 8, æqualia; filamenta $1\frac{1}{4}$ lin. longa; antheræ aureæ, lineari-lanceolatæ, $1\frac{1}{4}$ lin. longæ, obtusiusculæ, basi vix bilobæ, antice appendiculatæ, postice breviter calcaratæ. Ovarium ut in *P. uniflorâ*. *Capsula* subhemisphærica, subtetragona, costulis prominulis 8; valvæ 4, emarginatæ.

In damp places, from 4000 to 5000 feet (*Low*; *Haviland*, 1286).

A very well-marked species, nearer allied to *P. tonkinensis*, Stapf, than to the Bornean species hitherto known, but differing remarkably in the shape and the indumentum of the leaves, the almost sessile few-flowered cymes, the smaller anthers, and the distinctly emarginate valves. The extremely short peduncle and the reduction of the involucre to two small bracts give the plant a very different appearance when compared with *P. tonkinensis*, but the floral structure is the same, apart from the smaller size and the more linear shape of the anthers; and the ripe capsule is almost exactly of the same kind in both species. The general appearance, however, of *P. uniflora* is so very different from that of any *Phyllagathis* we know that I should not have hesitated to make it the type of a new genus if the structure of the flower and the capsule were not exactly the same as in *P. elliptica*; besides, the indumentum and the texture of the leaf point likewise to *Phyllagathis*. The inflorescence, too, though totally different at the first glance from that of *P. rotundifolia*, can easily be understood when compared with that of *P. elliptica*. The reduction of the peduncle and of the bracts is carried on still a little further and the cyme reduced to a single flower. It is true the habit is very different; but if we remember the great variety which the genus *Sonerila* exhibits in its vegetative architecture, while yet so uniform in its plan, we cannot separate the plant in question from *Phyllagathis* only on account of the habit.

MARUMIA PACHYGYNA, Korth. Verh. Nat. Gesch. Bot. 242, t. 59.

On the edge of a clearing, Penokok, alt. 3000 feet (*Haviland*, 1345).

Distribution: Borneo.

The leaves of the Kinabalu specimen agree exactly with those of *M. stellulata*, Blume, which comes extremely near and only differs in the ciliate calyx and the smaller flowers.

Dr. Haviland says in a note, "petals white." Korthals figures them pink. The colour evidently varies from pink to white.

DISSOCHÆTA ANNULATA, Hook. fil., ex Triana, in Trans. Linn. Soc. xxviii. 83.

At Bongol, on the Tawaran River, alt. 1200 feet (*Haviland*, 1385).

Distribution: West Malaya, from Penang to Borneo; Ceram.

DISSOCHÆTA HIRSUTA, Hook. fil., ex Triana, in Trans. Linn. Soc. xxviii. 83.

Climbing in trees in young jungle on the Ulu Tawaran, alt. 2000 feet, and near Kiau, alt. 3500 feet (*Haviland*, 1287, 1288).

Distribution: Borneo.

The ripe fruit is purple and 5–5½ lin. long.

MEDINILLA STEPHANOSTEGIA, Stapf, n. sp. Frutex vel suffrutex. Ramuli teretes, *novelli setulis rufis furfuraceo-puberulis brevissimis vestiti,* mox glabrati, albidi, ad nodos stuposo-barbati. Folia opposita, petiolo 1½ lin. longo suffulta, ovato-elliptica vel oblongo-elliptica, 2–2½ poll. longa, 1–1¼ poll. lata, basi rotundata, breviter obtuseque acuminata, primo utrinque parce setulis sæpe minutis furfuraceo-puberulis aspersa, mox glaberrima, 3-5-nervia vel 3–5plo-nervia, sæpissime pare infimo nervorum tenuissimo. Panicula terminalis *multiflora,* 3–4 *poll. longa, minute parceque furfuracea, ramis* 3–4 *verticillatis* patentibus, *bracteis suffultis,* cymas 3–1-floras *bracteatas* gerentibus. Bracteæ *oblongæ vel oblongo-lanceolatæ,* 3–6 *lin. longæ, membranaceæ, albæ vel pallide roseæ.* Pedicelli 1–3 lin. longi. Calyx breviter campanulatus, 2 lin. longus, glaber, limbo integro, membranaceo. Petala rosea, late ovata, 4 lin. longa, obtusissima, interdum apiculo minuto terminata. Stamina 8, æqualia vel subæqualia; antheræ e basi bilobâ lanceolatæ 2 lin. longæ, lobis processubus connectivi adnatis et brevissime ultra eos productis carinatis, postice in calcar deflexum breve abeuntes. Ovarium ad medium calycis tubum adnatum, inferne lamellis 4 ad verticem annulo crasso coronatum ductis cum tubo conjunctum. Stylus 3–4 lin. longus. Bacca calycis limbo persistente coronata, globosa, 2½ lin. dimetiens.

At 7600 feet (*Haviland*, 1171).

Allied to *M. himalayana,* Hook. fil., and probably to *M. eximia,* Blume, which I know from description only. From *M. himalayana* it differs, apart from the indumentum, in the rich, whorled, and multibracteate panicles. It is also related to some of the Philippine species, as *M. bracteata,* Blume, and *M. luzonensis,* Hook. fil., but less clearly.

MEDINILLA UROPHYLLA, Stapf, n. sp. Frutex alte scandens. Rami ramulique teretes, glabri, demum albidi. Folia *ternata,* petiolo ½ poll. longo suffulta, *obovato-oblonga,* 2½–3 poll. longa, 1–1¼ poll. lata, basi acuta, sæpe breviter in petiolum decurrentia, *caudato-acuminata,* subtus minutissime punctato-furfuracea, 3-*nervia,* nervis supra leviter impressis, subtus prominentibus, venis transversis vix conspicuis. Cymæ axillares, paucifloræ, plerumque umbelliformes, rarius racemose dispositæ, pedunculo ½–1 poll. longo suffultæ. Pedicelli 4–6 lin. longi. Calyx breviter cupulari-campanulatus, 2½ lin. longus, glaber, limbo integerrimo. Petala 5 alba, late obovata, 4 lin. longa, obtusa. Stamina 10, æqualia; antheræ longitudine tantum paulo inæquales, lineari-lanceolatæ, acuminatæ, 2–3 lin. longæ; connectivum antice in lobos 2 obtusos productum, postice calcaratum. Ovarium usque ad verticem calyci adnatum, lamellulis 10 angustis ad annulum staminigerum demum incrassatum ascendentibus. Bacca alba, globosa, 3 lin. dimetiens, limbo persistente coronata.

Penokok, alt. 3500 feet (*Haviland*, 1278).

Allied to *Medinilla crassinervia*, Blume, and *M. quintuplinervis*, Cogn., but distinguished from both by the ternate leaves, and, besides, from the former by the caudate apex of the leaves and the smaller flowers and fruits, and from the latter by the distinct 3-nerved leaves, the 5-merous flowers, and the longer inflorescences. It approaches still more to an undescribed species, collected by Forbes in New Guinea (no. 932), which has also ternate caudate leaves, but much larger flowers.

MEDINILLA LASIOCLADOS, Stapf, n. sp. Frutex. Ramuli novelli teretes vel subtetragoni, *dense setulis rufo-tomentosis* vestiti, demum glabrescentes; rami vetustiores robusti, tetragoni vel subteretes, glabrati, lenticellis tuberculiformibus obsiti. Folia opposita, elliptico-oblonga, $2\frac{1}{2}$–3 poll. longa, $1\frac{1}{2}$ poll. lata, basi rotundata, apice acuta, crassiuscula, in *gemmâ subtus densissime rufo-stellato-tomentosa*, mox glabrescentia, 3-*nervia vel* 3*plo-nervia*, evenia vel subevenia. Cymulæ axillares, sæpe in ramis annotinis paucifloræ, $\frac{1}{2}$–$\frac{3}{4}$ poll. longæ, bracteatæ, furfuraceo-tomentellæ. Bracteæ ovatæ, $\frac{1}{2}$–$1\frac{1}{2}$ *lin. longæ, acutæ, membranaceæ, binæ, sub calyce persistentes.* Pedicelli brevissimi, $\frac{1}{2}$–$\frac{3}{4}$ lin. longi. Calyx ovoideo-campanulatus, vix 2 lin. longus, *rufo-furfuraceus*, demum glabrescens et minute bullato-rugosus, limbo integerrimo. Petala rosea, 4, late obovata, $2\frac{1}{2}$ lin. longa, obtusa. Stamina 8, subæqualia; antheræ lineari-lanceolatæ, 1 lin. paulo longiores, basi brevissime bilobæ, lobis connectivi processubus adnatis carinatis, postice breviter calcaratæ. Ovarium ad medium calyci adnatum, superne lamellis ad annulum staminigerum demum incrassatum ascendentibus cum eo conjunctum.

At 6000 feet (*Haviland*, 1225).

Allied to an undescribed species from New Guinea (*Forbes*, 305) and to *M. rhodochlæna*, A. Gray, from the Fiji and Samoan Islands, but distinguished by tri-nerved or tripli-nerved leaves, much smaller bracts, and, so far as Forbes's plant is concerned, by a different indumentum.

ANPLECTRUM HOMŒANDRUM, Stapf, n. sp. Frutex humilis. Ramuli novelli teretes, graciles, minute rufo-furfuracei, mox glabrati; rami vetustiores cortice badio longitudinaliter fisso et secundum marginibus laciniarum soluto. Folia opposita, laminâ in plano mediano expansâ, petiolo 1 lin. longo suffulta, ovata (sine acumine), $1\frac{1}{2}$–$1\frac{3}{4}$ poll. longa, $\frac{3}{4}$–1 poll. lata, basi rotundata, *longe caudato-acuminata, acumine lineari* $\frac{1}{2}$–$\frac{3}{4}$ *poll. longo, vix* $\frac{3}{4}$ *lin. lato, obtuso,* coriacea, in gemmâ minute furfuracea, mox glabrata, supra opaca, subtus subnitida, 3*plo-nervia* vel pare infimo tenuissimo addito sub 5plo-nervia, nervis supra impressis, venis inconspicuis. Cymulæ 3–1-*floræ, breves, pedunculo* 1–2 *lin. longo suffultæ*, rufo-furfuraceæ, bracteatæ. Bracteæ lanceolatæ, acutæ, $\frac{1}{2}$–$\frac{3}{4}$ lin. longæ. Pedicelli 1–2 lin. longi. Calyx breviter ovoideo-campanulatus, $1\frac{1}{2}$ lin. longus, minute furfuraceus; limbus basi circumcirca constrictus, quadrilobus; lobi e basi ovatâ subulati, $\frac{1}{2}$ lin. longi. Petala 4, rosea, oblongo-lanceolata, $2\frac{1}{2}$–3 lin. longa. Stamina 8, *subæqualia*; antheræ 4 oblongo-lineares, basi brevissime bilobæ, connectivo non vel vix bicalloso, postice in calcar applanatum, obtriangulare, filamentum subamplectens producto, fertiles; antheræ 4

vix minores, connectivo antice in processus binos breves obtusos producto, postice in calcar breve conicum abeunte. Ovarium ad verticem subplanum calycis tubo adnatum. Bacca globosa, $1\frac{1}{2}$ lin. dimetiens, calyce persistente coronata, rubra.

At 6000 feet (*Haviland*, 1170).

Closely allied to *Anplectrum myrtiforme*, Naudin (=*Medinilla myrtiformis*, Triana), and distinguished only by the longer acumen of the rather tripli-nerved than quintupli-nerved leaves and by much shorter inflorescences. This species and likewise *A. myrtiforme* are, in spite of their almost equal anthers, true *Anplectrums*. They have quite the habit of *Anplectrum*, and agree also in the structure of the leaves and of the bark. Whether the smaller set of the anthers is fertile or not, I am not able to make out from the material at my disposal.

Kibessia tessellata, Stapf, n. sp. Rami obtuse tetragoni, *angulis anguste crispo-undulatis*, glabri. Folia *sessilia vel subsessilia*, ovata vel ovato-oblonga, $3\frac{1}{2}$–$5\frac{1}{2}$ poll. longa, 2–$2\frac{1}{4}$ poll. lata, basi late rotundata, plerumque plus minusve cordata, *apice sensim in acumen angustum obtusum producta*, tenuiter coriacea, concoloria, glaberrima, 5-nervia, nervis supra impressis, infra cum venis transversis prominulis. Cymulæ 3–1-floræ, axillares, singulæ vel paucæ fasciculatæ, $\frac{1}{2}$–1 poll. longæ, bracteatæ, glabræ. Bracteæ ovatæ, minutæ. Calycis tubus hemisphæricus, *squamis rhomboideis, crassis, subplanis vel umbonatis*, vel summis ovatis acutis vestitus, sub anthesi $2\frac{1}{2}$–3 lin. longus; limbus late conicus, caudato-apiculatus, 3 lin. longus. Petala lilacino-cærulea, ovato-triangularia, acuta, 3 lin. longa. Antheræ dolabriformes, utrinque inappendiculatæ, 1 lin. longæ. Bacca depresso-globosa, 5 lin. dimetiens, squamis—marginalibus exceptis—applanatis, inconspicuis.

At Koung, on the Tampassuk River, alt. 2000 feet (*Haviland*, 1303).

Closely allied to *K. simplex*, Korth. (*K. echinata*, Cogn.), and to an undescribed species from Penang (*C. Curtis*, 953), but differing from both in the winged stem and the sessile leaves, and, besides, from the former in the glabrous and short scales on the calyx and from the latter in the gradually tapering apex of the leaves.

Memecylon lævigatum, Blume, Mus. Bot. i. 358.

Low flooded land, near Tawaran (*Haviland*, 1384).

Distribution: Malaya, on the mainland as far as Tavoy.

The distribution of this species is in all probability much wider, as the characters supposed to distinguish it from several of the allied species are so trifling and so artificial that they can hardly be considered sufficient to maintain it as a distinct species. It approaches so near to *M. edule*, Roxb., that either part of that species must be transferred to *M. lævigatum*, or *M. lævigatum* should be included in it as a variety. In any case, the species of *Memecylon* have been multiplied far too much; a revision, however, of the genus, based on dried material only, would be very difficult.

Memecylon lanceolatum, Cogn. in DC. Monogr. vii. 1157.

At 6000 feet (*Haviland*, 1168).

I do not consider this determination as definitive. The species belongs to the doubtful

group just mentioned. It differs from typical *Memecylon lævigatum* chiefly in the narrower leaves with a longer acumen, in the longer pedicels, and a more conspicuous, distinctly 4-lobed calyx-limb. The leaves of *M. lanceolatum* vary from lanceolate ($1\frac{3}{4}$–2 : $\frac{1}{2}$ in.) with hardly any acumen to elliptic-oblong ($1\frac{3}{4}$–2 : 1 in.) with a very distinct acumen, and are 4–6 lin. in length. It is the latter form (*Beccari*, S. P. 2424) which is represented in the Kinabalu specimen, whilst the former (*Beccari*, 2118) is the type from which Cogniaux drew his description. The leaves of Dr. Haviland's specimen are olive-green to olive-brown above and yellowish green beneath, whilst those of Beccari's specimens are very dark above and olive-brown beneath, and an analogous difference is obvious in the colouring of the young branchlets. I doubt, however, very much whether this difference is a character of specific value. The berries of the Kinabalu plant are smooth, about 4 lin. in diameter, and supported by a pedicel 1–$1\frac{1}{2}$ lin. long. The pedicels rise from a very short common peduncle, and bear each two minute bracts at the base.

PLETHIANDRA HOOKERI, Stapf, n. sp. Frutex. Rami crassiusculi, teretes, cortice cinereo-albido. Folia petiolo 1 lin. longo, crasso suffulta, vel subsessilia, $2\frac{1}{2}$–4 poll. longa, $1\frac{1}{2}$–2 poll. lata, basi subrotundata, apice obtusissima vel subretusa, crasse coriacea, subconcoloria, utrinque nitidula, 5pli-nervia, paribus nervorum remotis, evenia. Flores axillares 3, rarius 4 vel 5 fasciculati. Pedicelli 2–3 lin. longi, crassiusculi, purpurei. Calyx urceolato-campanulatus, $2\frac{1}{2}$ lin. longus, glaberrimus, purpureus, limbo crassiusculo integro. Petala 6 rosea, obovato-elliptica, acuta, 3 lin. longa. Stamina vix 30 annulo incrassato inserta, exteriora 6 vel paulo plura longiora; filamenta circa 2 lin. longa; antheræ lineares, obtusæ, 1 lin. longæ, *basi inconspicue bilobæ, postice minutissime calcaratæ*, apice poro dehiscentes. Ovarium, usque ad verticem in medio leviter depressum, calyci adnatum, 6-*loculare*; *septa tenuissima*; placentæ bifidæ ex angulo superiore ortæ. Bacca (immatura) globosa, limbo calycino coronata, in vertice annulo staminigero persistente instructa.

At 6600 feet (*Haviland*, 1169).

There is no doubt that the plant just described belongs to *Plethiandra*, a genus founded by Sir Joseph Hooker on a rather poor specimen collected by Motley in Labuan. This genus was placed at the end of Melastomaceæ by the authors of 'Genera Plantarum,' and amongst Astronieæ by Cogniaux. The excellent material which is now in my hands enables me to determine its true position. It is nearest allied to *Medinilla*—so near, indeed, that it could be treated almost as a polyandrous section or subgenus of it. The general habit is exactly that of *Medinilla*, and the floral structure differs but little, apart from the number of the stamens. There are 6-merous species in various groups of *Medinilla*. The stamens are inserted, as in *Medinilla*, on the thickened annular internal margin of the calyx-tube in a single series, or nearly so; but the anthers are grouped finally more or less in concentric rows. Their shape differs from that of typical *Medinilla* in the almost absolute suppression of the processes of the connective and in their exactly linear shape. They open with pores like *Medinilla*. The authors of 'Genera Plantarum' say "rimis longitudinalibus antice dehiscentibus." I have not observed this mode of dehiscence either in *P. Hookeri* or in another new species from Sarawak, collected by

Dr. Haviland; and I find it only in a single flower in the type specimen. In this the few anthers which are still attached are slit from the top to the base, but the margins of the cell gape so much that the cell-septa are exposed, and, as the margins are moreover jagged, I suppose the state of these anthers is abnormal. On the other hand, we know certain *Medinillas* the anthers of which open with a short terminal slit. Therefore, if the anthers of *P. Motleyi*, Hook. fil., should indeed always open with a longitudinal slit, this would in no degree disprove the affinity of *Plethiandra* and *Medinilla*. The ovary is described by Sir Joseph Hooker as 4-locular. The only ovary of *P. Motleyi* which I dissected was in a rather advanced state, when the exceedingly thin septa are very apt to break either by the expansion of the growing fruit or by the slightest pressure. But, if I was not very much mistaken, it is also 6-merous. The very delicate structure of the septa may easily account for the oversight of one or more of them. The placentation is also exactly as in *Medinilla*.

SAMYDACEÆ.

Casearia leucolepis, Turcz. in Bull. Soc. Nat. Mosc. (1858) i. 463.

On the Tawaran River (*Haviland*, 1388).

Distribution: Malaya, from Java to the Philippines.

BEGONIACEÆ.

Begonia adenostegia, Stapf, n. sp. (§ *Platycentrum*). Herba epiphytica. Caulis gracilis, inferne induratus atque radicans, superne rubellus vel ruber, breviter crispule hirsutus. Folia petiolo, rubello crispule hirsuto, 3–5 lin. longo suffulta, valde oblique ovata, 3–4 poll. longa, $1\frac{1}{2}$–$1\frac{3}{4}$ poll. lata, basi valde asymmetrica, unilateraliter cordata, in latere extus spectante in lobum magnum rotundum producta, in latere interiore non vel vix auriculata, apice acuminata, in margine obscure denticulata, firme membranacea, supra glaberrima, subtus in nervis adpresse rufo-furfuraceo-hirsuta, in parte exteriore nervis basalibus 3–4, altius 2–3 lateralibus additis, in interiore nervo solitario basali percursa, venulis imprimis supra prominulis reticulata. Stipulæ ovatæ vel oblongæ, 3–4 lin. longæ, acutæ vel obtusæ, *margine plus minusve glandulis brevissime crasseque stipitatis obsitæ*, demum deciduæ. Inflorescentia *terminalis, rarius pseudolateralis et folio opposita*; *mascula racemosa vel parce paniculata, pluriflora,* $1\frac{1}{2}$–3 *poll. longa*; *feminea uniflora,* $1\frac{1}{2}$ *poll. longa*; *in utroque sexu pluribracteata.* Bracteæ oppositæ, cordato-ovatæ vel cordato-rotundatæ, inferiores 3 lin. longæ, membranaceæ, venosæ, *breviter glandulose fimbriatæ.* Pedicelli florum masculorum 2–1 lin. longi, femineorum demum 6–8 lin. longi. Flos masculus: Sepala alba rotundata, basi connata, 3 lin. longa. Petala alba 2, oblonga, 2 lin. longa. Stamina monadelpha; filamenta imâ basi connata, $\frac{1}{2}$–$\frac{3}{4}$ lin. longa; antheræ ovatæ vel oblongæ, apice emarginatæ. Flos femineus: Perigonii lobi 5, albi, ovati, majores 4 lin. longi. Ovarium glabrum, trialatum, alis oblique obovatis in pedicello breviter decurrentibus; styli 2, 1 lin. longi, iteratim dichotomi; stigmata in divisionum apicibus capitata, valde papillosa; loculi 2; placentæ bifidæ.

Capsula nutans, 6 lin. longa, alis 3 inæqualibus, majore subquadrato-rotundatâ, 6 lin. latâ, minoribus oblique obovatis, 3½ lin. latis, facie ventrali (alis minoribus circumdatâ) circumscissâ, deciduâ, faciebus dorsalibus primo juxta alas minores, demum circumcirca dehiscentibus.

Kinitaki, alt. 4500 feet (*Haviland*, 1270).

Allied to *Begonia varians*, A. DC., and *B. rupicola*, Miq., but very distinct by the peculiar inflorescence and the stalked glands of the bracts and stipules.

BEGONIA BURBIDGEI, Stapf, n. sp. (§ *Bracteibegonia*). Herba 6–8 ped. alta. Caulis inferne induratus, superne parce crispule hirsutus, internodiis ½–1½ poll. longis. Folia petiolo parce hirsutulo purpurascente ½–1½ poll. longo suffulta, valde asymmetrica, oblique cordato-ovata, 3–4 poll. longa, 2 poll. lata, in latere exteriore in lobum amplum rotundum producta, in latere interiore inauriculata, apice acuminata, repando-denticulata, firmula, utrinque glaberrima, lucida, in parte majore nervis basalibus 4–5 atque lateralibus 2–3 additis (intermediis 3 eximie bifurcatis), in parte minore nervis basalibus 2, lateralibus 2 additis, omnibus purpurascentibus, venulis inconspicuis. Inflorescentia *mascula terminalis*, 1–2-pollicaris, *parce dichotome ramosa*, 3–5-*flora*, *internodiis* (infimis interdum exceptis) *bracteis multo brevioribus*; *feminea ex folii summi axillâ uniflora vel dichotoma biflora*, 1½–2 poll. longa, *bibracteata*. Bracteæ in inflorescentiâ masculâ *oppositæ*, *imbricatæ*, *late obovatæ*, 5–8 *lin. longæ*, *membranaceæ*, *viridi-albidæ*, *glaberrimæ*, *persistentes*. Pedicelli 2 lin. longi vel subnulli. Flos masculus: Sepala 2 rotundato-quadrata, 6–10 lin. longa, albida, roseo-suffusa. Petala 2, ovato-oblonga, 4 lin. longa, alba. Stamina basi connata; filamenta ½–1 lin. longa; antheræ lineari-oblongæ, obtusæ, 1 lin. longæ. Flos femineus: Perianthii lobi 5, late obovati vel oblongi, majores ad 9–15 lin. longi. Ovarium subæqualiter trialatum, glaberrimum; styli 3 breviter bicrures; stigmata in marginibus crurum tortorum; loculi 3; placentæ bifidæ. Capsula a basi juxta alas dehiscens. Semina oblonga, ¼ lin. longa, apiculata, laxissime reticulata.

At 7600 feet (*Haviland*, 1188); in wet shady jungle above Kiau (*Burbidge*).

A very remarkable species, distinguished by the large, crowded, and persistent bracts.

BEGONIA OBLONGIFOLIA, Stapf, n. sp. (§ *Petermannia*). Caulis breviter crispule hirsutus. Folia petiolo 4–2 lin. longo eodem indumento ac caulis vestito suffulta, oblique oblonga, 4–6½ poll. longa, 1¾ poll. lata, in latere exteriore majore in lobum rotundatum brevissimum petiolo adnatum producta, in interiore rotundata, apice acuminata, serrulata, tenuiter membranacea, supra obscure viridia, imâ basi exceptâ glaberrima, subtus pallidiora, in nervis furfuraceo-puberula, nervis basalibus in latere exteriore 2–3, in latere interiore 1, lateralibus utrinque 6–7 angulo vix 40° ortis, subrectis. Stipulæ lineari-oblongæ, 6–7 lin. longæ, acutæ, membranaceæ, furfuraceo-puberulæ. Inflorescentia (mascula tantum nota) terminalis, *paniculata*, *multiflora*, furfuraceo-puberula, bracteata, fere 3 poll. longa. Bracteæ sub ramis primariis stipulis conformes, paulo minores, cæterum minimæ. Pedicelli graciles, ad 2 lin.

longi. Flos masculus: Sepala alba, rotunda, *vix 2 lin. dimetientia.* Petala *nulla*; filamenta basi connata brevissima; antheræ obovato-cuneatæ, obtusæ, vix $\frac{1}{2}$ lin. longæ. Capsula (ex icone) obovato-oblonga, ultra-pollicaris, trialata, alis æqualibus, 2 lin. longis.

Near the Dahombang River, alt. 3000 feet (*Haviland*, 1308).

Very like *Begonia lepida*, Blume, in general habit, but easily distinguished by the profuse inflorescence and the small apetal flowers. The latter character brings it to the section *Petermannia*, which is separable only artificially from § *Bracteibegonia*.

BEGONIA BORNEENSIS, A.DC., Prodr. xv. part i. 320 (§ *Petermannia*).

At 6000 feet (*Haviland*, 1189).

Distribution: Borneo.

There is no description of the male flowers in De Candolle's 'Prodromus.' Therefore I give it here:—

Inflorescentia mascula terminalis, interdum ex folii summi axillâ altera addita, paniculata, ramulis gracilibus, longe racemosis, ad $1\frac{1}{4}$ poll. longis, bracteatis; bracteæ oblongæ, caducæ, $1\frac{1}{2}$ lin. longæ vel minores, membranaceæ. Sepala alba, ovata vel oblonga, $1\frac{1}{2}$ lin. longa. Petala nulla. Antheræ in toro elongato subsessiles, obovatæ, $\frac{1}{3}$ lin. longæ.

The female inflorescence is axillary, from the axil of the uppermost leaf. It is reduced to a short peduncle with two pedicels about 9 lin. long. In its place there is in one of the Kinabalu specimens a male inflorescence. The capsules of the type are a little longer and their pedicels shorter, but the difference does not seem to me sufficient to make the Kinabalu plant a variety.

BEGONIA INOSTEGIA, Stapf, in Hook. Ic. Pl. t. 2309 (§ *Petermannia*). Caulis, ut petioli et inflorescentia, breviter crispule hirsutus, inferne glabratus. Folia petiolo 3–1 poll. longo suffulta, late et oblique cordato-ovata, 5–6 poll. longa, 4–5 poll. lata, sinu latissimo, apice acuminata, repando-denticulata, tenuiter membranacea, subconcoloria, maculata, supra basi exceptâ glaberrima, subtus in nervis minute furfuraceo-puberula, in parte majore exteriore nervis basalibus 5–6, in minore 3, lateralibus 3 vel 2 additis, fere omnibus semel vel bis furcatis. Stipulæ *persistentes, ovatæ acutæ*, 4–7 lin. longæ, *nervis crebris in setas* 4–7 *lin. longas excurrentibus crinito-fimbriatæ.* Inflorescentia mascula terminalis, iteratim tri- vel dichotoma, pedunculo 10 lin. longo suffulta, $\frac{3}{4}$ poll. longa, in racemulos breves abiens, bracteata. Bracteæ *stipulis conformes, minores summæ oblongæ, haud fimbriatæ.* Pedicelli 2–1 lin. longi, graciles. Inflorescentia feminea ex folii summi axillâ ad flores geminos ebracteatos redacta, pedicellis recurvis 10 lin. longis. Flos masculus: Sepala 2 alba, ovata vel oblonga, 2 lin. longa. Petala nulla. Stamina in toro filiformi elongato inserta; filamenta brevia vel brevissima; antheræ obovatæ $\frac{1}{3}$ lin. longæ. Flos femineus ignotus. Capsula obovoidea, 5–6 lin. longa, alis 3–$1\frac{1}{2}$ lin. latis basi ultra loculos productis; loculi 3 juxta alas dehiscentes; placentæ integræ. Semina minuta, breviter cylindrica, $\frac{1}{4}$ lin. longa, laxissime reticulata.

At 6000 feet (*Haviland*, 1190).

Very remarkable from the long fibres into which the nerves of the stipules and bracts run out. Otherwise the plant approaches *Begonia borneensis*, A. DC., in the general habit and in the floral structure.

UMBELLIFERÆ.

HYDROCOTYLE JAVANICA, Thunb. Diss. ii. 415, t. 2.

Bed of the Dahombang, alt. 3000 feet (*Haviland*, 1273).

Distribution: All over Malaya to the Philippines and Australia; Indo-China to Hupeh and Ichang; Khasia, Himalaya; Ceylon and Malabar.

According to Dr. Haviland, the plant is said to be used by the Dusuns like "tuba," for poisoning fish.

The specimen referred to *H. javanica* in Fl. of Trop. Africa iii. 4 is not that species.

TRACHYMENE SANICULÆFOLIA, Stapf, in Hook. Ic. Pl. t. 2308. Perennis. Rhizoma prostratum vel ascendens, ramosum. Rami in individuis in rupium fissuris crescentibus valde abbreviati, dense foliorum residuis squamiformibus vestiti, sub ipsâ facie rupium iteratim ramulosi, ramulis brevissimis densissime foliis vestitis et scapos umbelligeros edentibus; in individuis soli humidioris sæpe valde elongati, in parte subterraneâ crebre radicantes, in parte supraterraneâ e basi longe prostratâ ascendentes, pedunculos ex axillis foliorum edentes, caulis badii patule rufo-hirsuti internodiis in plantâ luxuriante ad 1 poll. longis vel longioribus. Folia petiolo glabro vel rufo-hirsuto $2\frac{1}{2}$–4 poll. longo suffulta, ambitu cordato-orbicularia, plerumque transverse latiora, ad $\frac{2}{3}$ triloba, lobis obovato-cuneatis, acute tridentatis vel in majoribus trilobulatis, lobulis tridentatis et dentibus interdum in latere exteriore denticulo auctis, 4–12 lin. longa, 8–18 lin. lata, crassiuscula, glaberrima vel utrinque hirsuta. Pedunculi (vel scapi) teretes, nudi, $2\frac{1}{2}$–9 poll. longi, tenuiter striati, rubelli. Involucri phylla linearia vel lanceolato-linearia acuta, 2–4 lin. longa, glaberrima vel hirsuta ciliataque. Pedicelli sub anthesi phyllis æquilongi, deinde paulo longiores, glabri vel parce hirsutuli. Calycis dentes persistentes, triangulares, distincti. Petala alba, obovata vel elliptica, 1–$1\frac{1}{4}$ lin. longa, supra costulâ medianâ notata. Antheræ roseæ, ellipticæ. Styli demum deflexi, vix $\frac{1}{2}$ lin. longi. Fructus a latere valde compressus, reniformis, $1\frac{1}{4}$–$1\frac{1}{2}$ lin. longus, $1\frac{3}{4}$–$2\frac{1}{4}$ lin. latus; mericarpia æqualia vel subæqualia, glaberrima, atropurpurea vel brunnea, exalata, jugis intermediis tenuissimis, marginibus interioribus approximatis.

From 7000 feet to the top, in the higher region in crevices of the rock and very stunted (*Low, Burbidge*; *Haviland*, 1130, 1162).

Nearest allied to *T. humilis*, Hook. fil., from the alpine and subalpine region of Victoria and Tasmania. The stunted, glabrous form agrees perfectly with *T. humilis* so far as its growth is concerned. The involucrum, the umbels, the flowers and fruits are, apart from the hairiness, exactly the same in both of the Kinabalu forms, and they differ hardly at all from those of *T. humilis*. Thus the main difference is in the shape of the leaves, and is rather considerable. The stunted and the creeping forms from Kinabalu look at

the first glance very different, but this difference is evidently and exclusively due to the extreme abbreviation of the internodes in the stunted form, and this again is caused by the conditions of the habitat. The hairiness or glabrousness is still less constant. There are hairy and glabrous stunted, and hairy and glabrous prostrate specimens. The same kind of hairiness, though in a minor degree, may be found on the petioles and the involucre of a specimen of *Trachymene humilis* from the Limestone River, collected by Sir F. v. Mueller, whilst all other specimens I have seen are glabrous.

RUBIACEÆ.

ARTHROPHYLLUM DIVERSIFOLIUM, Blume, Bijdr. 879.

On the Tampassuk River near Kiau, alt. 3500 feet (*Haviland*, 1254).

Distribution: All over Malaya, from the Andamans and Penang to North Borneo.

WENDLANDIA PANICULATA, DC., Prodr. iv. 411.

In young jungle near Kiau, alt. 3000 feet (*Haviland*, 1366).

Distribution: Malayan Archipelago, from Java to Borneo and the Moluccas.

ARGOSTEMMA BRACHYANTHERUM, Stapf, n. sp. Herba simplex e basi prostratâ ascendens, circa 4 poll. alta. Caulis adpresse hirtello-pubescens. Folia opposita, valde inæqualia; *majora* petiolo 1–1½ lin. longo suffulta, elliptica vel ovato-elliptica vel obovato-elliptica, 1¼ poll. longa, 7–9 lin. lata, basi rotundata et plerumque plus minusve asymmetrica, breviter acuminata, membranacea, supra obscure viridia, glaberrima vel marginem versus vel in margine parce pilosula, supra brunnea, in nervis adpresse hirtello-pubescentia, nervis utrinque circiter 8: *minora* sessilia, plerumque ad subulam brevem redacta, rarius laminâ ovato-lanceolatâ ad 3 lin. longâ. Stipulæ ovatæ ad 3 lin. longæ, obtusæ, minute et parce hirtellæ, tenuiter membranaceæ. Inflorescentia terminalis, breviter pedunculata, umbellatim 3-flora vel ad florem solitarium redacta; pedicelli hirtello-pubescentes 3–4 lin. longi. Calyx turbinatus, adpresse hirtellus; tubus 1 lin. longus, dentes *triangulares* 1 *lin. longi.* Corolla alba, breviter campanulata, 2 *lin. longa, ad medium* 5-*lobata*, extus densiuscule hirtella, intus in lobis ciliatis papillosa. Filamenta *brevissima, tubo imâ basi inserta, antheræ leviter cohærentes, oblongæ,* ¾ *lin. longæ, breviter obtuseque apiculatæ,* rimâ longitudinaliter dehiscentes. Stylus filiformis, 2 lin. longus; stigma capitatum.

At 3000 feet (*Haviland*, 1326).

Quite of the habit of *A. uniflorum*, Blume, but very different in the structure of the andrœcium; besides, the lobes of the calyx and the corolla are shorter and broader.

ARGOSTEMMA GRACILE, Stapf, n. sp. (Pl. XII. D. 10–12.) Herba prostrata in truncis arborum deciduarum. Caulis radicans, glaber. Folia opposita, valde inæqualia, insigniter disticha; *majora* brevissime petiolata, oblonga, 5–7 lin. longa, 2–2½ lin. lata, basi rotundata, apice apiculata, membranacea, supra obscure viridia, subtus pallida, utrinque in costâ fulvo-hirtella, evenia; *minora* subsessilia, ovata, ad 3 lin. longa, basi in latere extus spectante auriculata lobo acutiusculo. Stipulæ foliaceæ,

breviter cordatæ, $\frac{1}{2}$–$\frac{3}{4}$ lin. longæ, minute setaceo-caudatæ. Flos solitarius, terminalis, subsessilis. Calyx campanulato-turbinatus; tubus adpresse hirsutus, $1\frac{3}{4}$ lin. longus; *lobi æquilongi, late ovati, obtusiusculi*. Corolla alba, late campanulata, 4 lin. longa, fere ad medium 5-loba, *glaberrima*; lobi ovati acuti. Stamina 5, in imâ basi corollæ inserta, *libera*; *filamenta nigricantia, $\frac{1}{2}$ lin. longa*; *antheræ oblongæ exapiculatæ, longitudinaliter dehiscentes, $\frac{1}{2}$ lin. longæ*. Capsula hemisphærica, 2 lin. longa, lobis calycinis paulo auctis coronata. Semina numerosa, angulata, $\frac{1}{4}$ lin. longa.

On rotting fallen trunks of trees, at the Penokok, alt. 3500 feet (*Haviland*, 1325).

In habit very like *A. parvifolium*, Benn., but distinguished by the short free stamens, and by the much shorter and broader calyx lobes and the glabrous corolla. I suspect that some or all species of this interesting genus have dimorphic flowers.

HEDYOTIS PROTRUSA, Stapf, n. sp. (§ *Diplophragma*). (Pl. XII. A. 1–3.) Fruticulus (an herba lignescens?). Rami stricti, obtuse tetragoni, superne brevissime tomentelli, nigrescentes, inferne glabrati, pallescentes. Folia sessilia, oblongo-lanceolata, $\frac{1}{2}$ poll. longa, $1\frac{1}{2}$-2 lin. lata, *sæpe plicata*, basi et apice acuta, *crassiuscule coriacea, rigida, glaberrima, evenia*. Stipulæ triangulares, 1 lin. longæ, obtusæ, basi firmæ, superne et in margine albo-membranaceæ, demum laceræ. Inflorescentiæ *axillares, capitatim contractæ, pedunculo* 1–2 (*rarius* 4) *lin. longo suffultæ, plerumque bracteis binis foliaceis capitulum subæquantibus instructæ*. Pedicelli subnulli. Caly glaberrimus, nigrescens; tubus breviter turbinatus, $\frac{1}{2}$-$\frac{3}{4}$ lin. longus; lobi 4 lineares obtusi, 1 lin. longi, crassiusculi, sinu latiusculo distantes. Corolla alba, in fauce et in tubo 1–$1\frac{1}{4}$ lin. longo intus pilosa; lobi 4 ovato-oblongi, æquilongi, obtusiusculi. Stamina exserta; filamenta $\frac{3}{4}$ lin. longa, antheræ $\frac{1}{2}$ lin. longæ. Stylus $1\frac{1}{2}$ lin. longus; stigma breviter bilobum. Capsula *ad dentes medios protrusa*, in coccos binos secedens, 1 lin. longa; cocci facie fere ad basin atque in vertice loculicide dehiscentes. Semina numerosa, angulata, nigra, $\frac{1}{3}$ lin. longa.

Maripari Spur, alt. 5500 feet (*Haviland*, 1265).

Nearest allied to an undescribed species from Manilla in the Philippines (Voy. de la Bonite, no. 214?). But in this species the axillary inflorescences are very loose and almost 3 in. long, and the top of the capsule does not protrude beyond the calyx-tube. There is some affinity with several of the Ceylonese and Western Peninsular species which group round *H. stylosa*, Br., and it is, though remote, perhaps more evident than with any other species I know.

HEDYOTIS PULCHELLA, Stapf, n. sp. (§ *Diplophragma*). (Pl. XII. B. 4–6.) Rami superne obtuse tetragoni, glabri. Folia petiolo 2–3 lin. longo suffulta, elliptica vel ovata, 2–$2\frac{1}{2}$ poll. longa, 1–$1\frac{1}{4}$ poll. lata, basi acuta, sæpe paulo asymmetrica, apice acuminata, membranacea, utrinque striolis albidis notata, demum glabrata, supra olivaceo-viridia, subtus læte viridia, *nervis lateralibus utrinque* 7–8, inferioribus 5–6 approximatis, vix 2 lin. inter se distantibus, cæteris remotis. Stipulæ ovato-triangulares, 3 lin. longæ, laciniis angustissime linearibus hirtellis fimbriatæ, albo-striolatæ. Inflorescentiæ axillares, corymboso-paniculatæ, laxæ, graciles, pedunculo

gracili $1\frac{1}{2}$–$2\frac{1}{2}$ poll. longo suffultæ, ad ramificationes foliaceo-bracteatæ, glaberrimæ, albo-striolatæ. Bracteæ lanceolatæ vel superiores lineari-lanceolatæ. Pedicelli 3–1 lin. longi. Calyx læte viridis, glaberrimus; tubus turbinatus, 1–$1\frac{1}{4}$ lin. longus; *lobi* 4, *lineari-lanceolati*, $1\frac{1}{2}$–2 *lin. longi, longe acutati.* Corolla alba breviter infundibuliformis, extus glabra; *tubus vix* 2 *lin. longus*, intus pilosus; lobi 4, ovato-oblongi, subacuti, æquilongi, intus a fauce albo-villosi. Stamina 4; filamenta in fauce inserta, 1 lin. longa; antheræ $\frac{3}{4}$ lin. longæ, albæ. Stylus 3 lin. longus; stigma brevissime bilobum. Capsula *calycis faucem non superans*, 1 *lin. longa*, in coccos 2 fissa; cocci facie late aperti. Semina numerosa, angulata $\frac{1}{4}$–$\frac{1}{6}$ lin. longa, minute granulata, nigra.

From 7000 to 9000 feet (*Haviland*, 1122).

Nearest allied to an undescribed species from the Philippines (*Cuming*, 937; *Vidal*, 377, 800). This differs chiefly in smaller flowers and capsules, shorter calyx-teeth, and fewer nerves. It grows on Mt. Banahao, at 6000 feet. *Hedyotis pulchella* approaches otherwise, though in a much more remote degree, *H. tenuipes*, Hemsl., from South China, and *H. macrostemon*, Hook. et Arn., also from South China. Amongst the Indian species *H. pruinosa*, Wight. & Arn., comes nearest; but this affinity also is by no means close.

Hedyotis macrostegia, Stapf, n. sp. (§ *Diplophragma*). (Pl. XII. c. 7–9.) Suffrutex, 2–3 ped. altus. Rami crassiusculi fusco-tomentelli. Folia petiolo glabro 3–5 lin. longo suffulta, oblongo-elliptica, 2 poll. longa, $\frac{3}{4}$–1 poll. lata, basi acuta, apice acute acuminata, crassiuscula, glaberrima, subconcoloria, olivaceo-viridia, nervis utrinque 7–8, inferioribus 5 approximatis, $1\frac{1}{2}$ lin. inter se distantibus, angulo 30° ortis, supra impressis, infra valde prominulis. Stipulæ amplæ, liberæ, latissime ovatæ, 6 lin. longæ, lacinulis ciliatis fimbriatæ, glaberrimæ, albo-striolatæ, demum albescentes. Inflorescentiæ *axillares*, pedunculo sæpe flexuoso, 2 poll. longo, hirsuto, demum glabrato suffultæ; flores sessiles, in cymulis 3-floris capitato-congesti vel infimis distinctius pedunculati, bracteis foliaceis plus minusve involucrati. Bracteæ infimæ ovatæ, subacuminatæ, glabræ, more foliorum stipulatæ, capitulo paulo breviores; *superiores* minores, ciliatæ, et supra quoque plus minusve pilosæ, basi utrinque laciniâ fimbriatâ structurâ stipularum auctæ. Calycis tubus turbinatus, vix $1\frac{1}{2}$ lin. longus, albo-striolatus; lobi 4 (rarius 5) ovati acuti, ciliati, et supra versus apicem pilosi, 2 lin. longi; lobuli lanceolati vel lineares, ciliati, duplo breviores interjecti. Corolla alba, breviter infundibuliformis, utrinque pilosa; tubus 1–$1\frac{1}{4}$ lin. longus; lobi ovati, $1\frac{1}{2}$ lin. longi, obtusiusculi, pilosi. Stamina 4; filamenta $1\frac{1}{2}$ lin. longa; antheræ lineari-oblongæ, 1 lin. longæ. Stylus $2\frac{1}{2}$ lin. longus; stigma incrassatum, brevissime bilobum. Capsula globosa, $1\frac{1}{2}$ lin. longa, haud ultra calycis limbum producta, in coccos duos secedens; cocci facie et vertice late aperti. Semina circa 10–15 in utroque cocco, angulata, $\frac{1}{4}$–$\frac{1}{6}$ lin. longa, nigra, minutissime granulata.

From 8000 to 12,000 feet (*Low*; *Haviland*, 1120).

A very fine species, of the habit of *H. Lessertiana*, Arn. But the inflorescences are, as in the previous two species, axillary, the axis terminating with a bunch of leaves which grow out in the next season and again produce flowers from the axils only. However

different the habit of the three species here described may be, they evidently belong to one natural group of species which seems to be limited to North Borneo and the Philippines, although parallels may be found amongst the continental species, in South China as well as in the Western Ghats and in Ceylon.

MUSSÆNDA FRONDOSA, Linné, Spec. Pl. ed. I. p. 177.

At Kiau, alt. 2500 feet (*Haviland*, 1355).

Distribution: Tropical Himalaya; Western Ghats; Malaya, from the Andamans to New Guinea and the Philippines.

I refer this plant to *M. frondosa* with some hesitation, as it is evidently in a diseased state. It is nearest to the variety *hirsutissima*, Hook., but the calyx-teeth are broader than they generally are in the specimens I have seen from the Western Peninsula, and the only normal corolla is much smaller. All other corollas in the two specimens from Kinabalu are very much widened (8 lin. by 2½ lin.), the anthers are replaced by thick filaments, and the tube is quite glabrous inside. The style is also thickened and more or less deformed. The ovary, however, appears normal. There was always a loose, crumb-like, black matter, perhaps the excrements of an insect, in the upper part of the tube. C. B. Clarke observed a very similar state in *M. frondosa* v. *hirsutissima* at Canoor, and Hasskarl describes the same deformation from "*M. frondosa*, L., ε. *glabra*, Vahl," from Java. The ovaries in the Kinabalu specimens, and still more in some from the Nilgherries, are swollen, as if fertilized, and in the latter resemble half-mature berries. The case deserves investigation on the spot. From the glabrousness of the tube I should suggest that the deformed flowers are female, and this is the more probable from the analogous case which Mr. Clarke has represented in a sketch. But then the only normal flower which came from an inflorescence with otherwise deformed female flowers would be male, to judge from analogy, whilst Burck found the dimorphism combined with diœcism.

MUSSÆNDA COCCINEA, Stapf, n. sp. Frutex, 4–6 ped. altus. Rami teretes, patule rufo-hirsuti. Folia formâ valde variabilia, nunc petiolo vix ½ poll. longo suffulta, ovata vel elliptica, 4–5½ poll. longa, 2–2½ poll. lata, basi breviter et abrupte contracta, acuta vel breviter acuminata, firmula, supra nigricantia, pube rufâ conspersa, subtus densius breviterque rufo-hirtella, demum plus minusve glabrescentia, nervis lateralibus primariis utrinque 8–9, inferioribus 4–5 lin. distantibus, venis transversis distinctis, nunc longius petiolata (ad 10 lin.), oblongo-lanceolata, 4½–6 poll. longa, 2 poll. lata, basi longe in petiolum attenuata, longius acuminata, supra minus rufescentia, in nervis venulisque tantum pilis minutis albidis adpresse hirtella, nervis eodem numero, sed inferioribus magis distantibus. Cymæ sub anthesi valde contractæ, demum laxiores, in inflorescentiâ terminali interdum floribundâ racemose vel paniculatim, dispositæ, rufo-hirtellæ vel hirsutæ, bracteatæ. Bracteæ ovato-lanceolatæ, 2–2½ lin. longæ, dense rufo-tomentosæ. Stipulæ bifidæ, laciniis e basi triangulari subulatis 2–3 lin. longis, rufo-tomentosis. Pedicelli sub anthesi brevissimi, demum ad 2 lin. longi, dense rufo-hirtelli. Calyx rufo-hirtellus; tubus ovoideus, 2 lin. longus; *lobi decidui, lanceolati, tubo vix longiores, acuti.* Corolla coccinea, extus

rufo-hirtella; *tubus tenuis*, 1 *poll. longus*, in parte tertiâ superiore paulo dilatatus, intus aureo-pilosus; *lobi ovato-lanceolati, acuminati*, 5–6 *lin. longi*, papillosi, in alabastro valde reduplicati. Stamina in parte tubi dilatatâ breviter inserta; antheræ lineares, 3 lin. longæ, basi anguste et longiuscule bilobæ. Stylus filiformis, 1 lin. longus, bifidus, ramulis vix ½ lin. longis. Ovarium 2-loculare; placentæ ex axi ortæ, plus minusve bifidæ. Bacca obovoidea, ad 6 lin. longa, nigra vel albido-maculata, rufo-hirtella, septis tenuissimis. Semina numerosa, angulata, ¾ lin. longa, pallida, minute scrobiculato-granulata.

On the Tampassuk and the Dahombang rivers, from 2000 to 3400 feet (*Low; Haviland*, 1356, 1357).

Distribution: North Borneo.

Beccari, no. 456, from Sarawak, a fruiting specimen, belongs evidently to the same species, and probably also no. 2362, which, however, has glabrous berries.

Mussænda coccinea is intermediate between typical *Mussænda* and the more herbaceous forms which are referred to *Acranthera*, a genus which was reduced to *Mussænda* by Baillon (Hist. des Pl. vii. 449), whilst it was maintained by K. Schumann in Engler, Natürl. Pflanzenfam. iv. Th. 4 Abth. 63, although chiefly on an erroneous representation of the structure of the ovary which was introduced first by Arnott in his original diagnosis of the genus (Ann. Nat. Hist. iii. 20). According to this author the ovarium is "pseudo-biloculare, dissepimentis duobus oppositis, vix ad medium attingentibus, placentam bilamellatam divaricatam ferentibus." But the fact is that even in the species on which the genus was founded, viz. *A. zeylanica*, the ovary is perfectly bilocular and that the bilamellate placenta rises from the axis, just as it does in typical Mussændas. But the division of the placenta often reaches almost the centre, and then disintegration easily takes place, particularly when the transverse sections are not made with a sharp razor. I dissected various flowers and semi-mature fruits and always found the septa reaching right through. So far there is no difference between *Acranthera* and *Mussænda*. The berry of *A. Maingayi*, Hook. fil., was stated to be 2-celled by the author himself in Hook. fil. Fl. Brit. Ind. iii. 92; Hemsley pointed out the 2-celled structure of the ovary for *A. Griffithii*, Hook. fil. (in Hook. Ic. Pl. t. 1718), and I find it also in *A. tomentosa*, Brown, *A. grandiflora*, Bedd., and *A. anamallica*, Bedd. Nevertheless, I think, *Acranthera* must be retained as a well-marked genus after excluding *A. Maingayi* and *A. Griffithii*. It may be characterized by the herbaceous growth, the generally elongated ovary and fruit, the blue or reddish, upwards widened and funnel-shaped or campanulate corolla, and the club-shaped, entire style. It is known from Ceylon, the Tinnevelly and Anamally Hills, the Khasia Hills, Cachar and Manipur, and there are several species, still undescribed, in the Kew Herbarium, from Borneo. *Acranthera Maingayi*, *A. Griffithii*, *Mussænda mutabilis*, Hemsl., *M. kiutaensis*, King, mss. (Perak, fl. Mal. Pen. no. 4255, *King's* Coll.), and a new species from Borneo (Sarawak, *Lobb*), form another very natural group, which are nearer to the Indian Mussændas; they still differ, however, in the habit by the straggling or bushy growth, larger corollas, and the absence of an enlarged calyx-lobe. The species enumerated here are all very closely allied, and will perhaps be partly reduced in future. Their corollas are of a brilliant orange

colour, which sometimes turns scarlet. This group is connected with the true Mussændas by *M. coccinea*, which has no enlarged calyx-lobe and scarlet flowers, but otherwise comes very near to them, particularly in the leaves and fruit. These species can hardly be separated from *Mussænda*, but they might be made conveniently into a separate section, for which I propose the name *Asemanthia*.

The leaves of *M. coccinea*, as it is represented by no. 1357 of Haviland, differ at the first glance considerably from the fruiting specimen, 1356, and from Low's specimen. But there is no doubt about the identity of the latter and 1356, and as the inflorescence and the flowers of Low's plant and of no. 1357 entirely agree, I have no doubt that they all belong to one species, especially as one of the leaves of no. 1357 has a much shorter petiole and is comparatively broader, thus approaching the shape of the leaves in Low's plant, and as the nervation follows the same type, though the nerves are more distant in accordance with the lengthened shape of the blade.

Burck (Ann. du Jard. Buit. iii. 108–112) has shown that at least several of the Mussændas are diœcious. It is rather difficult to check his investigations on dry material. The structure of the corolla is certainly of the male type, and the anthers are polliniferous in the two flowering specimens in my hands; further, the style is very short and in all probability imperfect. The ovary is apparently fertile, but the numerous ovules did not give me the impression that they are so. The specimen of *M. mutabilis* figured in Hook. Ic. Pl. t. 1718 is male also; but the specimen of the new species, collected by Lobb in Sarawak, seems to be female. The corolla tube is a little widened above, but gradually and much less than in the male flowers of *M. coccinea* and *M. mutabilis*, and the anthers are indehiscent; the corolla tube, however, is golden papillose down to their insertion, as one would expect for male flowers. On the other hand, the style reaches to the tips of the anthers and divides into two subulate branches which slightly surpass the mouth of the corolla.

ACRANTHERA ATROPELLA, Stapf, n. sp. Herba perennis. Caulis nigricans, sparse et tenuiter adpresse sericeo-pilosus, demum glabratus. Folia petiolo 1–1½ poll. longo adpresse tenuiterque pubescente suffulta, elliptica vel elliptico-oblonga, 4–5 poll. longa, 1½–2¼ poll. lata, utrinque æqualiter acuta, membranacea, supra nigricantia, glaberrima, exsiccata ob epidermatis cellulas collapsas minutissime foveolato-punctata, subtus fusca, in nervis venisque et hinc inde in parenchymate pilis tenuibus adpressis pubescentia, nervis lateralibus primariis 6–8 valde prorsus arcuatis, venulis indistinctis. Stipulæ (summæ mihi tantum notæ) *oblongæ*, ¾–1 *poll. longæ*, obtusissimæ, nigricantes, sparsissime adpresseque pilosæ vel glabratæ. Inflorescentia terminalis, pseudo-umbellata, sessilis, foliorum paribus 2 summis valde approximatis suffulta et eorum stipulis subinvolucrata. Pedicelli nutantes 2 lin. longi, griseo-pubescentes. Calycis adpresse pubescentis tubus subcylindricus, sursum paululo dilatatus, vix 4 lin. longus; lobi 5, ovato-lanceolati, circiter 4 lin. longi, roseo suffusi. Corolla obscure cyanea, *late tubuloso-campanulata*, extus griseo-pubescens intus glaberrima; tubus 5 lin. longus, 2 lin. latus; lobi 5, oblongo-lanceolati, subpatuli, apice recurvi, 3 lin. longi. Stamina 5, imâ basi corollæ inserta; filamenta

brevissima; antheræ conniventes, primo subcohærentes, lineares, vix 3 lin. longæ; connectivum in subulam ultra loculos productum. Stylus crassiusculus, 3 lin. longus; stigma capitatum, papillosum. Ovarium biloculare; placentæ ex axi ortæ, inæqualiter et crassiuscule bilamellatæ, multi-ovulatæ.

On damp places, alt. 5000–6000 feet (*Low; Haviland*, 1237).

This species belongs to a group which is a representative of the *Acranthera* species of Ceylon, the Tinnevelly, the Anamally, and the Khasia Hills. I know three or four species from Borneo. They differ from the former chiefly in the short and wide corolla and the large upper stipules, which form a kind of involucre. The structure of the andrœcium and gynæcium, however, is essentially as in *A. zeylanica*, Arn.

LUCINÆA PENTACME, Stapf, n. sp. Frutex scandens, glaberrimus. Rami novelli tetragoni, nigricantes, annotini cortice pallescente. Folia petiolo 2–3 lin. longo suffulta, *elliptico- vel lanceolato-oblonga*, $1\frac{1}{4}$–$2\frac{1}{2}$ poll. longa, $\frac{3}{4}$–1 poll. lata, utrinque acuta vel basi subrotunda vel apice subacuminata, *coriacea*, flavido-viridia, partim exsiccando nigricantia, nervis lateralibus *indistinctis* utrinque 7–8 vel inconspicuis, *evenia*. Stipulæ purpurascentes, fere ad medium in tubum connatæ, ovatæ, *acuminatæ*, diutius persistentes, demum deciduæ. Capitula *terminalia, solitaria*, pedunculo $\frac{1}{4}$–$\frac{3}{4}$ poll. longo suffulta, basi *bracteis in cupulam connatis* obtusissimis involucrata. Calyx (sub anthesi) liber, ovoideo-cupularis, 3 lin. longus; limbus truncatus. Corolla roseo-albida; tubus brevissimus, fauce albo-papilloso-villosâ; lobi in alabastro ad medium arcte cohærentes, abhinc mox *liberi, erecti, triquetro-acuminati*, appendiculis 2 lin. longis. Stamina 5, in fauce inserta. Stylus apice bifidus. Ovarium biloculare; placentæ peltatæ, multi-ovulatæ.

At the top of a ridge, alt. 6600 feet (*Haviland*, 1238).

Very near to *L. montana*, Korth., to which I believe a specimen collected by Motley (no. 659) near Banjermassin to belong, of which, however, I have not seen the type. It differs in the thicker branches with a whitish thin bark which early peels off irregularly, in the purplish acuminate stipules, in the more coriaceous veinless leaves with very inconspicuous nerves, and probably also in the larger flowers. From *L. morinda*, DC., it differs in the narrower and thicker leaves with very inconspicuous nervation, in the solitary heads supported by cup-shaped bracts, and in the long free tips of the corolla-lobes.

LUCINÆA NERVULOSA, Stapf, n. sp. Frutex scandens, glaberrimus. Rami novelli tetragoni, nigricantes, annotini cortice papyraceo albido, mox plus minusve soluto, laxe vestiti. Folia petiolo $\frac{3}{4}$ poll. longo suffulta, *ovato-oblonga vel elliptica*, 3–$3\frac{1}{2}$ *poll. longa*, $1\frac{1}{2}$ *poll. lata*, basi rotundata, rarius brevissime in petiolum attenuata, breviter acuminata vel obtusa (ob apicem vulneratum?), supra nigricantia, subtus olivaceo-fusca, *nervis lateralibus primariis distinctis utrinque circiter* 11, *secundariis interjectis sæpe æqualiter distinctis, venulis laxe et plus minusve conspicue reticulatis*. Capitulum terminale, solitarium, *pedunculo* $\frac{1}{2}$ *poll. longo* suffultum, bracteis binis obtusissimis in cupulam patelliformem connatis instructum, circa 12-

florum; flores arcte congesti, sed liberi. Calyx ovoideo-cupularis, 3 lin. longus; limbus truncatus. Corollæ tubus $3\frac{1}{2}$ lin. longus, superne dilatatus, intus ad $\frac{2}{3}$ albo-villosus; lobi 5 lanceolati, $2\frac{1}{2}$ lin. longi, crassi, appendicibus in alabastro sæpe liberis, brevibus, carinato-triquetris, carinâ basi in denticulum deflexum productâ. Stamina 5; filamenta $\frac{3}{4}$ lin. longa; antheræ oblongo-lineares, $1\frac{1}{4}$ lin. longæ, exsertæ. Stylus apice clavatus, bifidus. Ovarium biloculare; placentæ peltatæ, multi-ovulatæ.

At 7000 feet (*Haviland*, 1239).

Closely allied to *Lucinæa pentacme* and to *L. montana*, but differing from both in the larger leaves, from the former also in the very distinct venation, and from the latter in the loose papyraceous bark, the shorter peduncles, and the larger flowers.

MYRIONEURON BORNEENSE, Stapf, n. sp. Herba. Caulis crassiusculus, tenuissime rufo-tomentellus, demum glabrescens. Folia apicem versus congesta, petiolo 1–2 poll. longo suffulta, lanceolato-oblonga, 7–10 poll. longa, 2–3 poll. lata, basi longe attenuata vel plus minusve in petiolum angustissime decurrentia, apice acuminata, membranacea, supra nigricantia, infra fusca, utrinque parce pilis tenuibus rufis adpressis conspersa, *nervis lateralibus utrinque* 8–10 *e basi curvata subrectis, valde prorsus ductis, venis distinctis subtransversalibus.* Inflorescentiæ ex axillis superioribus pedunculo 3–4 lin. longo crassiusculo suffultæ, *capitatim coarctatæ*, bracteatæ. Bracteæ extimæ foliaceæ, e basi latissimâ ovatæ, tenuiter acuminatæ, 8 lin. longæ, demum evanidæ, capitula involucrantes, sequentes ovatæ, interiores oblanceolatæ, flores brevissime pedicellatos æquantes, rufo-pilosæ. Calyx rufo-pilosus; tubus breviter turbinatus, $1\frac{1}{2}$ lin. longus; *lobi* 5, *lineari-lanceolati*, 2 lin. longi, acuti. Corolla alba; tubus lobis calycinis æquilongus, intus in fauce pilosus; lobi 5, ovati, breves, $\frac{3}{5}$ lin. longi. Stamina 5, sub fauce inserta; filamenta tenuia, vix $\frac{1}{2}$ lin. longa; antheræ lineari-oblongæ, apice exsertæ, $\frac{3}{4}$ lin. longæ. Fructus subbaccatus, didymus; pyrenæ binæ crustaceæ, vix $1\frac{1}{2}$ lin. longæ, teretes. Semina numerosa, angulata, minute granulata, placentâ mediæ axi affixâ.

At 3000 feet (*Haviland*, 1332).

It seems to be nearest allied to an undescribed species from the Admiralty Islands ('Challenger' Exp.), which I am inclined to refer to this genus, and to another species from the Mishmi Hills (*Griffith*, 2850), also undescribed. The latter has, however, much looser inflorescences and narrower calyx-lobes, and approaches more *M. nutans*, Wall., whilst the former differs in the venation of the leaves and is particularly distinguished by the laciniate bracts.

UROPHYLLUM SUBANURUM, Stapf, n. sp. ♀. Frutex. Rami obtuse tetragoni, badii vel superne exsiccando nigricantes, glaberrimi, vel novelli sparse adpresseque pilosuli. Folia petiolo 4–8 lin. longo robusto suffulta, *ovata vel elliptica*, 3–$3\frac{1}{2}$ poll. longa, $1\frac{1}{2}$–2 poll. lata, basi breviter acuta vel rotundata, apice *breviter vel vix acuminata, subcoriacea*, utrinque glabra vel subtus in costâ validâ et in nervis primo pilis fulvis adpressis induta, nervis lateralibus utrinque distinctis, subtus prominentibus, patulis, fere ad marginem leviter arcuatis, abhinc abrupte prorsus flexis, utrinque circiter 10, 3–4 lin. inter se distantibus, venulis transversis, flexuosis, creberrimis, prominulis,

elongato-triangulares, $\frac{1}{2}$ poll. longæ, hirtellæ. Inflorescentiæ pseudo-umbellatæ, 4–5-floræ, pedunculo 5–1 lin. longo adpresse hirtello suffultæ; bracteæ pseudo-verticillatæ, lanceolatæ, 1–2 lin. longæ, hirtellæ; pedicelli $\frac{1}{4}$–$\frac{1}{2}$ poll. longi, divergentes. Calyx hemisphærico-turbinatus, nigricans, glaber; tubus $1\frac{1}{4}$ lin. longus; limbus breviter 5-dentatus, dentibus late triangularibus. Corolla alba, late breviterque campanulato-tubulosa, ad $\frac{2}{5}$ 5-lobata, deinde profundius fissa, 3 *lin. longa*, crassa, extus glaberrima, fauce villosa; lobi triangulari-ovati, acuti. Stamina 5; filamenta toro cum corollâ inserta, libera vel medio tubo plus minusve adnata, sed facile separata; antheræ oblongæ, polline destitutæ; connectivum dorso vix gibbosum in apiculum productum. Stylus crassiusculus, 2 lin. longus, lobis 5 linearibus æquilongis. Ovarium 5-loculare; placentæ peltatæ, multi-ovulatæ. Bacca lutea, siccando nigricans, globosa, limbo coronata, 3 lin. dimetiens.

At 10,500 feet (*Haviland*, 1074).

Urophyllum subanurum belongs to the group of *U. corymbosum*, Korth., which is represented in Malaya by numerous species, most of which are still undescribed. It is distinguished chiefly by the firm, broad, and very shortly acuminate leaves, and by rather large flowers. These are, like those of the following species, dimorphic. The apparently normal anthers of the female are absolutely destitute of pollen when examined in bud.

Urophyllum cyphandrum, Stapf, n. sp. Frutex. Rami vix tetragoni, glabri vel primo adpresse hirtelli, interdum nigro-purpurascentes. Folia petiolo $\frac{1}{2}$ poll. longo, glabro vel hirtello suffulta, *ovato-oblonga vel lanceolato-oblonga*, 4–6 poll. longa, $1\frac{1}{2}$–$2\frac{1}{4}$ poll. lata, *basi breviter acuta vel subrotundata, apice longiuscule caudato-acuminata,* firme membranacea, plerumque plus minusve purpurascentia, imprimis in nervis, glabra vel subtus in costâ valde prominulâ et in nervis hirtella, *nervis lateralibus utrinque* 9–10, 4–6 *lin. inter se distantibus, fere a basi longe prorsus arcuatis,* prosilientibus, venis transversalibus flexuosis distinctis. Stipulæ oblongæ acutæ, 6 lin. longæ, hirtellæ. Mas: Inflorescentiæ pseudo-umbellatæ, 6–9-floræ, pedunculo hirtello 4–6 lin. longo suffultæ, basi bracteis pseudo-verticillatis lineari-lanceolatis 2–3 lin. longis instructæ; pedicelli 4–8 lin. longi. Calyx breviter cupularis, $1\frac{1}{2}$ lin. longus, nigricans, sparsissime hirtellus; limbus 5-dentatus. Corolla *alba* breviter tubulosa, ad medium fere 5-loba, extus glabra, fauce villosa; tubus 2 lin. longus; lobi ovati, acuti, subæquilongi. Stamina 5; filamenta cum corollâ toro inserta, paulo sub fauce cum tubo cohærentia, cæterum libera; antheræ polliniferæ, ellipticæ oblongæ, $\frac{3}{4}$ *lin. longæ*; connectivum *postice valde gibbum,* in apiculum productum. Stylus rudimentarius, brevis, laciniis 5 filiformibus. Ovarium minute 5-loculare, loculis vacuis vel placentâ rudimentariâ ovulisque paucis. Femina: Inflorescentia ut in mare, sed gracilior, glabra, 5–2-flora; pedicelli demum ad $\frac{3}{4}$ poll. longi. Calyx subglobosus, 1–$1\frac{1}{2}$ lin. longus; limbus basi constrictus, breviter 5-dentatus. Corolla (in alabastro tantum nota) maris corollæ simillima, sed *minor.* Stamina iis maris similia, multo minora, inania. Stylus crassiusculus, laciniis 5 lineari-lanceolatis. Ovarium 5-loculare; placentæ peltatæ, multi-ovulatæ. Bacca globosa, limbo calycino coronata, $2\frac{1}{2}$ lin. dimetiens.

At 7800 feet (*Haviland*, 1123 ♀, 1124 ♂).

Closely allied to the preceding species, but sufficiently distinct by the shape and nervation of the leaves, by the much smaller female flowers, and by the gibbous shorter anthers. The sexual difference is well marked by the different shape of the calyx, by the size of the flowers, and by the development of the anthers and the stigmata. The insertion of the filaments is very curious; but this mode is probably not so rare as one would suppose. Clarke has stated, in Journ. Linn. Soc. xvii. 159, that they are free in the female flower of *Adenosacme longifolia*, and H. Baillon indicates a similar condition for *Acranthera zeylanica* and *Mussænda Landiæ*.

UROPHYLLUM LINEATUM, Stapf, n. sp. Frutex humilis. Rami obtuse tetragoni, robusti, adpressissime et densissime griseo-sericeo-velutini. Folia petiolo crassiusculo 2–3 lin. longo suffulta, ovato-oblonga vel oblonga, 2–2½ poll. longa, 1–1¼ poll. lata, basi breviter acuta vel subrotundata, apice acuta, in margine (exsiccando ?) plerumque revoluta, crassa, coriacea, olivaceo-viridia, supra costâ pilosulâ exceptâ glaberrima, subtus in *costâ nervisque argenteo-sericea, cæterum glabra, nervis lateralibus* 16–19 *subrectis, angulo* 45° *ortis,* 1–1½ *lin. inter se distantibus, supra impressis, subtus ut costâ valde prosilientibus*, venulis transversis creberrimis inconspicuis. Stipulæ lineari-lanceolatæ, 3 lin. longæ, subsericeæ. Inflorescentiæ pseudo-umbellatæ, sessiles, basi bracteis ovatis vel lanceolatis 1–1½ lin. longis subsericeis instructæ; pedicelli 1–1½ lin. longi. Calyx nigricans, glaber vel subglaber, in flore masculo breviter cupulari-turbinatus, in flore femineo subglobosus; limbus 4-, raro 5-dentatus, dentibus minutis. Corolla ignota. Bacca nigra, globosa, 4–5-locularis, limbo calycino coronata, 2½ lin. dimetiens. Semina numerosa, in placentis peltatis carnosis, distincte granulata.

Maripari Spur, alt. 5500 feet (*Haviland*, 1266).

A very fine plant, distinguished by the numerous closely set nerves, which are, like the midrib, very prominent and white silky. Though the nervation appears at the first glance very different from that of the described Urophyllums, it does not differ typically. The calyx, the berries, and the seeds are those of typical *Urophyllum*.

UROPHYLLUM SALICIFOLIUM, Stapf, n. sp. Frutex. Rami graciles, teretes, dense adpresseque fulvo-griseo-pilosi. Folia pedunculo 3–4 lin. longo suffulta, lanceolata, 2½–3½ poll. longa, 7–10 lin. lata, basi breviter acuta, apice acuminata, pergamacea, supra obscure olivaceo-viridia, præter costam pilosulam glabra, supra flavido-viridia, in costâ et in nervis adpresse pilosa, cæterum glabra, *nervis lateralibus utrinque* 12–13, 2–3 *lin. inter se distantibus, prominentibus, paulo supra basin valde prorsus flexis et usque ad nervum collectivum valde distinctum rectis*, venis transversis creberrimis, tenuissimis. Stipulæ lineares, 3–4 lin. longæ, dense pilosæ. Inflorescentiæ ad *flores* 1–2 basi bracteatos reductæ, supra-axillares; pedicelli 1 lin. longi, adpresse pilosi. Calyx pilosulus; tubus globosus, vix 1 lin. longus; *limbus basi constrictus ad* ⅜ *4-dentatus, dentibus late triangularibus,* ⅜ *lin. longis*. Ovarium 4-loculare; placentæ peltatæ, multi-ovulatæ. Bacca globosa, 2 lin. dimetiens dentibus ob margines involutos subulatis coronata.

At 6000 feet (*Haviland*, 1231).

I have described this plant notwithstanding the imperfect material, as there is no doubt about its generic affinity, and because I think it is sufficiently marked by the characteristic nervation, the very reduced inflorescence, and the comparatively large membranaceous caly-xlimb. Apart from the inflorescence it resembles *Urophyllum streptopodium*, Wall., but the nerves are more numerous, closer, and straighter.

UROPHYLLUM LONGIDENS, Stapf, n. sp. ♀. Frutex. Rami teretes, densissime adpresseque flavido-cano-hirtelli. Folia petiolo eodem indumento vestito 5–7 lin. longo suffulta, lanceolata vel oblongo-lanceolata, 4–4½ poll. longa, 1 poll. lata, basi acuta, apice acuminata, subcoriacea, flavido- vel cano-viridia, supra costâ nervisque adpresse hirtellis exceptis glabra, opaca, subtus in nervis venisque adpresse strigilloso-hirtella, nervis lateralibus utrinque 11–12, angulo 40° ortis, subrectis, sub margine arcuatim connexis, nervo circumcirca marginante addito, venis transversis flexuosis, supra tenerrimis, subtus validioribus, prominentibus. Stipulæ e basi triangulari lineari-subulatæ, 6–7 lin. longæ, hirtellæ, mox deciduæ. Cymulæ 3–1-floræ, sessiles; bracteæ triangulares, 1 lin. longæ; pedicelli hirtelli, 2–3 lin. longi. Calyx adpresse hirtellus; *tubus ovoideus vel obovoideus, 1½ lin. longus*; *lobi 4 lineares, 1–1½ lin. longi.* Corolla viridi-alba; tubus 1¼–1½ lin. longus, pro ratione latus, extus glaber, in fauce villosus; lobi 4, ovati, tubo paulo breviores, extus apice pilosuli. Stamina imperfecta 4 vel pauciora, fauci inserta; filamenta ⅓ lin. longa; antheræ minute cordatæ, effetæ. Stylus crassiusculus, superne dilatatus, 1⅓ lin. longus; stigmatis lobi 4, lineari-oblongi, ¾–1 lin. longi. Ovarium 4-loculare; ovula numerosa in placentâ mediâ peltatim affixa.

At 7600 feet (*Haviland*, 1120).

One of the best marked species the affinity of which I find difficult to point out. It comes probably nearest to *U. salicifolium*, Stapf.

RANDIA DENSIFLORA, Benth., Fl. Hongk. 155.

A small tree, near Koung, at 2000 feet (*Haviland*, 1380).

Distribution: All over Malaya, Indo-China, to the Philippines and North Australia; on the mainland from Singapore to Cachar and Upper Assam and in Travancore; South China.

IXORA KINABALUENSIS, Stapf, n. sp. Frutex, inflorescentiis exceptis, glaberrimus. Ramuli graciles, pallidi. Folia pedunculo ½–¾ poll. longo suffulta, oblongo-lanceolata, 4–5 *poll. longa*, 1½–2 *poll. lata*, basi acuta, apice acuminata, coriacea, supra lucida, exsiccata olivaceo-viridia, nervis lateralibus utrinque 10–12, angulo 50–60° ortis, leviter arcuatis, nervo collectivo distincto, supra impressis, infra prominulis. Stipulæ e basi breviter lateque ovatâ abrupte subulatæ, sine subulâ 1 lin. longæ. Inflorescentia terminalis, brachiato-corymbosa, pendula, pedunculo 4–7 poll. longo, minute puberulo suffulta, supra basin et ad ramos infimos bracteata, puberula. Bracteæ lanceolatæ 1–2½ lin. longæ, inferiores more foliorum stipulatæ. Pedicelli 1–2 *lin. longi, graciles, basi plerumque nudi*, vel rarissime minute bracteo-

lati. Calyx ovoideus, vix 1 lin. longus, glaber, dentibus 4 brevibus rotundatis. Corollæ *tubus* ruber, gracilis, 9 *lin. longus*; *lobi* fere albi, *obovato-oblongi*, 3 lin. longi, obtusissimi. Filamenta latiuscula, $\frac{1}{2}$–$\frac{3}{4}$ lin. longa; antheræ sagittatæ, 2 lin. longæ. Stylus circiter $1\frac{1}{2}$ lin. corollam superans; stigma bilobum, lobis crassiusculis. Bacca globosa vel subdidyma, $4\frac{1}{2}$ lin. dimetiens, vel transverse latior, loculo altero sæpe abortivo.

At 5000 feet (*Haviland*, 1236).

Closely allied to *Ixora pendula*, Jack, but distinct by the smaller leaves and chiefly by the always distinct pedicels, which very rarely are supported by minute bracteoles, and by the shorter corolla with broader lobes. In *I. pendula* the flowers are constantly sessile and supported by one or (if terminal) by two minute bracteoles.

PAVETTA LIMBATA, Stapf, n. sp. Frutex humilis. Rami novelli subteretes, nigrescentes, puberuli, mox glabrati, annotini pallidi, internodiis plerisque brevibus, 2–5 lin. longis. Folia petiolo 2–3 lin. longo suffulta, lanceolata, 3–$3\frac{1}{2}$ poll. longa, $\frac{3}{4}$–1 poll. lata, basi cuneatim attenuata, apice acute acuminata, membranacea, glabra, luride olivacea, nervis lateralibus utrinque circa 7, 5–9 lin. inter se distantibus, tenuibus, angulo 45°–40° ortis, in nervum submarginalem collectis. Stipulæ late ovatæ, mucronatæ, 2 lin. longæ. Inflorescentia terminalis, pubescens, thyrsoideo-paniculata, juvenilis 1–$1\frac{1}{2}$ poll. longa, bracteata; bracteæ ad 1 lin. longæ, subulatæ; flores pedicellati; pedicelli $1\frac{1}{2}$–2 lin. longi, graciles. Calyx minutissime puberulus, tubus ovoideus, $\frac{1}{2}$ lin. longus; *limbus æquilongus, submembranaceus, e basi constrictâ cupuliformiter ampliatus, 5-lobulatus, lobulis e basi constrictâ latissime ovatis, transverse latioribus, minute ciliolatis.* Corollæ (ex alabastris 2–3 lin. longis fere perfectis tantum notæ) tubus brevis; lobi 5, lineari-oblongi. Stamina 5; filamenta brevia; antheræ lineares, vix 2 lin. longæ. Stylus filiformis, superne incrassatus, simplex. Ovarium biloculare; ovula solitaria medio affixa.

At 6000 feet (*Haviland*, 1240).

Allied to *P. indica*, L., but the calyx is very different in the comparatively wide submembranaceous limb and the very short but broad minutely ciliate lobes.

PSYCHOTRIA MALAYANA, Jack, in Mal. Misc. i. 3.

Low land, on the Tawaran River (*Haviland*, 1389).

Distribution: Malaya: Penang, Sumatra (?), Java, Borneo.

I consider this plant as identical with Jack's *P. malayana*, as it is represented by Wallich's *P. aurantiaca*, no. 8335 (coll. by W. Jack, 1819, at Penang), and it is certainly identical with various specimens from North Borneo, as Motley's, Labuan (218), and Dr. M. Fraser's, Kudat (86). The lower cyme branches are often opposite, but sometimes, like the upper ones, whorled. I refer also to it Zollinger's specimens (173); a specimen, sent by Teysmann from Java, named *Chasalia expansa*, Miq.; and one from Miquel's herbarium named *P. aurantiaca*, Miq. A capsule with loose fruits attached to Teysmann's specimen contains two kinds of fruits. Two of them, which are more elongate, have 8 deep furrows and do not belong to this species, as Sir J. Hooker has suggested. The remaining

fruits agree perfectly with those of the Bornean plant, and, as a comparison with the young fruit still attached to the branch proves, they belong doubtless to Teysmann's specimen. But the true *Ch. expansa*, Miq., or *Psychotria expansa*, Bl., is a different plant with membranaceous leaves and identical with *P. montana*, Bl. The fruit is slightly compressed from the back and hardly furrowed at all. The endosperm is very ruminate. A specimen collected by Motley at Banjermassin (608), and probably identical with *P. crassifolia*, Miq., comes also very near, but it has smaller and more coriaceous leaves. The inflorescence and the fruits, however, are exactly as in *P. malayana*.

The Kinabalu specimens represent the microstyle form. The stigmata, which are a little narrower and perhaps less papillose than in the macrostyle form, almost reach the mouth of the corolla, whilst the filaments surpass the mouth to the extent of $\frac{3}{4}$–1 lin. The anthers are about 1 lin. long. This form is represented also by a part of Zollinger's specimens (173), whilst Teysmann's and those of Fraser and Motley belong to the macrostyle form. Here the style surpasses the mouth by more than 1 lin., whilst the anthers, which are also 1 lin. long, just reach the mouth by their tips. The filaments are extremely short. The microstyle flowers were observed in inflorescences with half-mature berries. The anthers, which in both forms hardly differ, were always found to bear apparently quite normal pollen. A curious intermediate state is represented by another of Zollinger's specimens, also numbered 173. It is evidently macrostyle; but two of the stamens are exserted, 3 included. They, however, do not seem to be quite normal. The stigmata are long, linear, and minutely papillose. The flowers exhibit another abnormality. The corolla is 4-lobed, apparently by the coalescence of two lobes, whilst the andrœcium is pentamerous. The exserted stamens stand one on each side of the double lobe, which is hardly larger than the other lobes, whilst a small stamen is opposite to it. The remainder of Zollinger's specimens is pentamerous, like all other specimens I have seen, except those of Fraser's and Motley's collection, which are tetramerous.

PSYCHOTRIA GYRULOSA, Stapf, n. sp. (§ *Grumilea*). Frutex scandens (?). Rami glabri, demum pallidi. Folia petiolo 4–5 lin. longo suffulta, lanceolata, $3\frac{1}{2}$–7 poll. longa, 1–$1\frac{1}{2}$ poll. lata, basi cuneatim attenuata, acuta vel subacuminata, pergamacea, glabra, supra nigricantia, subtus nitore rubello suffusa, nervis lateralibus 9–12, 6–8 lin. inter se distantibus, arcuatis, valde prorsus ductis, marginem versus venis transversis tenuibus. Inflorescentia terminalis, paniculata, pedunculo $2\frac{1}{2}$ poll. longo stricto suffulta, ramis verticillatis quaternis, *cymulas paucifloras subumbellatim dispositas* gerentibus. Baccæ *sessiles, pedunculis ad* 2 *lin. longis, pedicellos imitantibus, insidentes*, globoso-pyreniformes, 3–4 *lin. longæ*, indistincte ruguloso-costatæ, calycis limbo parvo coronatæ. *Pyrenæ* crustaceæ, intus gyroso-rugulosæ, rugis lævissimis præsertim inter costas transverse directis et varie inter se confluentibus. Albumen rugis conformatum, gyroso-ruminatum.

At the Penokok, alt. 3200 feet (*Haviland*, 1335).

There was a flowering branch sent on the same sheet and with the same label. It is

very likely that it belongs to the same species as the fruiting branch, but as there are some differences in the leaves and in the inflorescence I do not feel quite sure of it. The following is a description of it:—

Folia petiolo 5–6 lin. longo suffulta, inferiora lanceolata, $2\frac{1}{2}$–$4\frac{1}{2}$ poll. longa, $\frac{3}{4}$–$1\frac{1}{2}$ poll. lata, basi acuta, apice subacuminata, nervis lateralibus utrinque 7–11, 4–5 lin. inter se distantibus, superiora multo majora, oblonga vel obverse lanceolato-oblonga, 6–8 poll. longa, $2\frac{1}{4}$–$2\frac{3}{4}$ poll. lata, basi acuta, apice obtuse acuminata, nervis 15–16, 4–6 lin. inter se distantibus, angulo circa 50°–60° ortis, subrectis, sub margine breviter arcuatim in nervum collectivum connexis, venis tenuibus transversis laxis, omnia glabra, supra obscure olivacea, subtus pallidiora, nitore rubello inconspicuo. Stipulæ ovatæ, ad $\frac{2}{3}$ connatæ, obtusissimæ, vix 4 lin. longæ. Inflorescentia terminalis, paniculata, minutissime puberula; pedunculus 5 lin. longus; rami oppositi, summi verticillati, infimi 1 poll. longi; *cymulæ paucifloræ subumbellatim dispositæ; flores sessiles vel pseudopedicellati*, alares bracteolis minutissimis 2 instructi. Calyx cupulari-turbinatus, 1 lin. longus, glaber; limbus truncatus vel minutissime denticulatus. Corollæ *tubus* 2 *lin. longus, rectus*, fauce villosus, villo vix exserto; lobi 4, ovato-oblongi, $1\frac{1}{4}$ lin. longi, patuli vel reflexi. Stamina 4 *exserta; filamenta* 1–$1\frac{1}{4}$ *lin. faucem superantia; antheræ* $\frac{3}{4}$ *lin. longæ*, oblongo-lineares. Stylus inclusus; stigmata oblonga (semper?) cohærentia faucem vix attingentia.

This species is certainly allied nearly to *P. aurantiaca*, but distinctly different in the looser inflorescence, and the smaller flowers with much smaller more exserted anthers and smaller berries. The flowers are all sessile, but, as the lateral flowers of the outermost cymes are suppressed, the central flower is borne by the peduncle of the reduced cyme and supported by the minute bracts of the dichasium.

PSYCHOTRIA ITEOPHYLLA, Stapf, n. sp. Frutex humilis, glaberrimus. Rami teretes, lineâ e commissurâ decurrente prominente notati, nigricantes. Folia petiolo $\frac{1}{2}$–$\frac{3}{4}$ lin. longo suffulta, *lanceolata*, 4–5 poll. longa, $\frac{3}{4}$–$1\frac{1}{2}$ poll. lata, basi longe cuneatim attenuata; apice sensim acuminata, obscure undulata, supra obscure olivacea, subtus rubro-suffusa, nervis lateralibus utrinque 9–10, patulo-erectis, leviter arcuatis, in nervum marginalem plus minusve distinctum collectis, laxe et imperfecte reticulata. Stipulæ e basi ovatâ longiuscule acuminatæ, 3–5 lin. longæ. Inflorescentia terminalis, corymboso-paniculata, $1\frac{1}{4}$ poll. longa, 2 poll. lata; pedunculus 1 poll. longus; rami oppositi, inferiores iteratim di- vel trichotomi; *cymulæ paucifloræ, laxæ*, minutissime bracteatæ; *pedicelli graciles*, 1–$1\frac{1}{2}$ *lin. longi*. Calyx cupulari-turbinatus, $\frac{3}{4}$ lin. longus. Corollæ albæ tubus $\frac{1}{2}$ lin. longus, pro ratione latus, *in fauce lineâ villosâ notatus*; lobi 5, ovati, 1 lin. longi, reflexi. Stamina 5; filamenta ad basin corollæ distincta et facile separata (an libera?), *circiter* $\frac{3}{4}$ *lin. faucem superantia*; antheræ ellipticæ, vix $\frac{1}{2}$ lin. longæ. Stylus 1 lin. exsertus; stigma clavato-incrassatum. Bacca rubra, ellipsoideo-globosa, 3 *lin. longa*, 8-sulcata; *pyrenæ tenuiter crustaceæ*, dorso profunde sulcatæ. Albumen æquale, endocarpio conformatum, sulcatum.

At the Penokok, alt. 3500 feet (*Haviland*, 1321).

Allied to *Psychotria erratica*, Hook. fil., and to *P. viridiflora*, Reinw., but differing from the former in the generally narrower leaves, the looser inflorescences, and the pedicelled flowers with more exserted anthers and a much less villous throat, and from the latter, which it approaches indeed very closely, in the narrower leaves, but chiefly in the larger, more oblong berries, with a much thinner endocarp.

PSYCHOTRIA DENSIFOLIA, Stapf, n. sp. (Pl. XIII. B. 11–13.) Frutex humilis, plerumque epiphyticus, glaberrimus. Rami teretes vel obscure tetragoni, novelli obscuri, annotini cortice sulcato cinerascente vestiti, *internodiis* 4–5 *lin. longis.* Folia *petiolo* 1 *lin. longo vel breviore suffulta, ovato-elliptica vel elliptica,* 8–10 *lin. longa,* 6–7 *lin. lata,* basi breviter acuta vel subrotundata, apice acuta vel obtusiuscula, coriacea, flavido-viridia vel fuscescentia *utrinque lucida,* nervis lateralibus utrinque 5, angulo 45° ortis, subrectis, tenuibus, subevenia. Stipulæ e basi connatâ brevissime latissimeque ovatæ, apiculatæ, purpurascentes, deciduæ. Inflorescentia terminalis, corymbulosa, pedunculo 2–4 lin. longo suffulta, $\frac{1}{2}$ poll. longa, $\frac{3}{4}$ poll. lata; flores 5–8 umbellatim congesti in ramulis 2–4 lin. longis; pedicelli sub anthesi 1 lin. longi. Calyx cupulari-turbinatus, 1 lin. longus; limbus 5-dentatus. Corolla viridula, extus minute papillosa; tubus latiusculus, superne sensim dilatatus, 1 lin. longus; lobi 5, ovato-oblongi, demum reflexi, $\frac{3}{4}$ lin. longi. Stamina 5; filamenta ad medium tubum corollæ adnata, $\frac{1}{2}$ lin. exserta; antheræ oblongæ, vix $\frac{1}{2}$ lin. longæ, albidæ. Stylus inclusus, cum stigmate clavato $\frac{3}{4}$ lin. longus. Bacca ellipsoideo-globosa, $2\frac{1}{2}$ lin. longa, calyce persistente coronata, indistincte costata; pyrenæ tenuiter crustaceæ, distinctius 4-sulcatæ. Albumen (seminis semimaturi) indistincte ruminatum.

At 8000 feet (*Haviland*, 1116).

Nearest allied to *P. polycarpa*, Hook. fil., but one of the best marked species, distinguished by the crowded, small, and glossy leaves, and the short inflorescences.

STREBLOSA URTICINA, Stapf, n. sp. (Pl. XIII. A. 1–10.) Herba scandens. Caulis teres, primo minutissime furfuraceus, mox glabratus, olivaceo-fuscus, internodiis lineis e commissuris decurrentibus prominulis notatis. Folia petiolo $\frac{1}{2}$–$1\frac{1}{4}$ poll. longo suffulta, oblongo-lanceolata, $5\frac{1}{2}$–$7\frac{1}{2}$ poll. longa, 2–$2\frac{1}{4}$ poll. lata, basi longe attenuata, subacuminata, tenuiter membranacea, exsiccando olivaceo-membranacea, subtus in nervis minutissime furfuraceo-puberula, cæterum glabra, nervis lateralibus utrinque 12–15, erectis, inferioribus approximatis. Stipulæ ad basin bifidæ, segmentis e basi triangulari subulatis 1 lin. longis. Paniculæ axillares petiolos æquantes, pedunculo $\frac{1}{2}$ poll. longo suffultæ, dense minuteque furfuraceo-hirtellæ; *rami simplices vel dichotomi, graciles, interrupte subspiciformes; flores* in ramis vel ramulis *solitarii vel geminati; bracteæ subtendentes minutæ, aliæ oppositæ paulo majores; pedicelli brevissimi.* Calycis limbus truncatus, minutissime 4-denticulatus, minute hirtellus, persistens, $\frac{1}{4}$ lin. longus. Corolla (ex alabastris tantum nota) æstivatione valvatâ vel, ob loborum margines exteros interdum perpaulo ampliatos, specie subimbricatâ; tubus brevis, intus basin versus pilosulus. Filamenta glabra; antheræ oblongæ. Discus depresso-globosus, magnus. Ovarium biloculare; stylus glaber;

stigma bilobum, lobis ovatis; ovula solitaria, fere ex imâ basi erecta. Fructus globosus, 1 *lin. dimetiens*, jugis 8 prominulis, minutissime hirtellus, dipyrenus; pyrena altera minor vacua; endocarpium crustaceum in facie ventrali sulcatum vel plus minusve bisulcatum. Albumen æquale.

At the Penokok, alt. 3200 feet (*Haviland*, 1328).

I think *Streblosa* should be kept up as a distinct genus on account of its peculiar habit, which is produced chiefly by the herbaceous growth, by the very thin leaves, the axillary inflorescences (which in the present species resemble very much those of a common nettle), and by the minute flowers and fruits. Miquel says of *Streblosa*, "frutices"; but the specimens I saw of *Psychotria tortilis*, Blume, the only species seen by him, are decidedly herbs. The genus *Streblosa* is limited to Malaya.

GÆRTNERA RUFINERVIS, Stapf, n. sp. Frutex. Ramuli graciles, novelli sparse rufo-pilosuli, demum glabrati, cortice cinerascente. Folia petiolo plerumque 2–4 lin., raro ad 7 lin. longo suffulta, lanceolata vel oblanceolata, 3–4 poll. longa, 1 poll. lata, longe in petiolum attenuata, apice acuminata, tenuiter coriacea, exsiccando rufo-fusca, supra glaberrima, subtus primo in nervis plus minusve rufo-furfuracea, mox, axillis nervorum hirsutulis exceptis, glabrata, nervis lateralibus utrinque 7–9 supra leviter impressis, subtus prominentibus, sub margine arcuatim collectis. Stipulæ 2–3 lin. longæ ad medium *tubulose connatæ, demum profundius fissæ, apice late rotundatæ*, ciliatæ. Panicula pedunculo $\frac{1}{4}$–$\frac{3}{4}$ poll. longo suffulta vel subsessilis, brachiata, 1–1$\frac{1}{4}$ poll. longa lataque, furfuraceo-puberula; cymulæ densæ in corymbum dispositæ; bracteæ minutæ, acutæ; pedicelli brevissimi. Calyx turbinatus, paulo ultra $\frac{1}{2}$ lin. longus; *lobi rotundati, minuti*, ciliatuli. Corollæ tubus 1 *lin. longus*, in fauce dense villosus; lobi late ovati, vix $\frac{3}{4}$ lin. longi. Stamina breviter exserta, $\frac{1}{3}$ lin. longa; filamenta antheris paulo breviora. Stigmata crassiuscula.

At 6000 feet (*Haviland*, 1210).

Allied to *G. Junghuhniana*, Miq., but chiefly distinct by the shape of the stipules, by weaker panicles, smaller flowers (about half the size), and by the shape of the calyx-limb.

CHASALIA GRACILIS, Stapf, n. sp. Frutex glaberrimus. Rami graciles, teretes, lineis e commissuris decurrentibus tenuibus notati, viridi-albidi. Folia petiolo tenui, 2 lin. longo suffulta, *ovato-lanceolata*, 2 *poll. longa*, 7–9 *lin. lata, basi cuneata, apice acuminata, tenuiter membranacea*, in margine circumcirca tenuiter incrassata, pallide olivacea, nervis lateralibus utrinque 7–9, tenuibus, inferioribus 2–3 lin. inter se distantibus. Stipulæ e basi connatâ brevissime ovatæ, pallidæ, vix 1 lin. attingentes. Inflorescentia terminalis, corymbulosa, pedunculo 1–1$\frac{1}{2}$ poll. longo gracili suffulta, minute bracteata; bracteæ subulatæ; flores pedicellati; pedicelli $\frac{1}{2}$–$\frac{3}{4}$ lin. longi. Calyx cupulari-turbinatus, $\frac{3}{4}$ lin. longus; limbus 5-denticulatus, minutissime papillosus. Corollæ tubus fauce villosus, pro ratione latus, $\frac{3}{4}$ lin. longus; lobi 5, oblongi, æquilongi. Stamina 5, sub fauce inserta; filamenta brevissima; antheræ ellipticæ, $\frac{1}{3}$ lin. longæ. Stylus e fauce breviter exsertus, 1 lin.

longus; stigma bilobum, lobis latis obtusis. Bacca (immatura) subglobosa, 2 lin. longa, calycis limbo coronata, minute albo-lineolata.

At the Penokok, alt. 3500 feet (*Haviland*, 1294).

Closely allied to *Chasalia rostrata*, Miq., but the leaves are thinner and of a different shape, and smaller than in any specimen of *C. rostrata* I have seen.

Lasianthus kinabaluensis, Stapf, n. sp. Frutex *glaberrimus*. Rami graciles, teretes, flavido- vel fusco-virides. Folia pedunculo 2–3 lin. longo suffulta, elliptico-oblonga vel oblongo-lanceolata, 3–3½ poll. longa, ¾–1¼ poll. lata, basi acuta, apice subcaudato-acuminata, firmule membranacea, pallide viridia, nervis lateralibus utrinque 5–6, valde arcuatis, *venis laxissime anastomosantibus, paucis, rectis vel subrectis*. Inflorescentiæ ad receptacula parva nodiformia sessilia redactæ, paucifloræ, axillares; pedicelli nulli. Calycis tubus ovoideus vel oblongus, 1 lin. longus; lobi 5–3, lineari-oblongi *obtusiusculi*, æquilongi. Corollæ *tubus tenuis*, 1½ *lin. longus*, fauce villosulus; lobi 5–3, lineari-oblongi vel oblongi, intus papillosi, tubo æquilongi. Stamina 5–3, fauci inserta; antheræ subsessiles, oblongæ, ½ lin. longæ. Stylus exsertus, 2 lin. longus; stigma bilobum. Ovarium 5-3-loculare; ovula solitaria, basalia. Bacca globoso-pyreniformis, calyce coronata, 2 lin. longa; pyrena unica; loculi cæteri abortivi (an semper ?).

At the Penokok, alt. 3000–3200 feet (*Haviland*, 1306, 1323).

Allied to *L. lucidus*, Bl., which it resembles very much in every respect; but *L. kinabaluensis* differs in the entire absence of all indumentum, in a somewhat different nervation—the veins being less straight and more loosely anastomosing,—and in the smaller flowers with obtuse calyx-lobes. The leaves are very minutely pellucid-dotted in consequence of the very loose spongy mesophyll.

Lasianthus membranaceus, Stapf, n. sp. Frutex *glaberrimus*. Rami teretes, pallide olivacei. Folia petiolo 4–7 lin. longo suffulta, oblonga vel elliptico-oblonga, 5–7½ *poll. longa*, 2½–3 *poll. lata*, basi acuta, abrupte breviterque acuminata, *membranacea*, pallide lurideque viridia, *nervis primariis utrinque* 5–6 *basi plerumque patulis, tunc valde prorsus arcuatis, secundariis tenuioribus plerumque* 3–4 *interjectis*, cum venis laxissime reticulantibus. Stipulæ breviter lateque triangulares. Inflorescentiæ axillares ad receptacula nodiformia redactæ; alabastra plura, flores perfecti vero pauci; pedicelli nulli. Calycis tubus obovoideus, ¾ lin. longus, dentibus 4 triangularibus, tubo dimidio fere minoribus, crassiusculis. Corollæ tubus 1½ lin. longus, fauce villosus; lobi lineari-oblongi 4, intus papillosi. Stamina 4; antheræ subsessiles, lineari-oblongæ, ½ lin. longæ, inclusæ. Stylus 6 lin. longus, exsertus. Ovarium 4-loculare; ovula solitaria, basalia. Bacca 4½ lin. longa, bipyrena; pyrenæ inæquales.

At the Penokok, alt. 3000 feet (*Haviland*, 1300, 1336).

Allied to *L. oliganthus*, Hook. fil., from Ceylon, but perfectly glabrous, and the leaves more membranaceous, larger, and with a somewhat different venation. They are full of minute pellucid dots, as in the preceding species.

LASIANTHUS MEMBRANACEUS?, Stapf, var. FIRMA, n. var. Folia minora elliptica, 3–4 poll. longa, $1\frac{1}{2}$–2 poll. lata, abrupte acuminata, firmiora, nervis plerumque utrinque 4, minus patulis. Bacca ellipsoidea, utrinque breviter attenuata; pyrenæ crasse crustaceæ 2, quarum unâ minore vacuâ.

On the Kadamaian, alt. 5000 feet (*Haviland*, 1241).

In spite of the smaller and much firmer leaves, I believe this form should be referred to the species just described. The venation of the leaves is evidently of the same type, though the nerves are less spreading and fewer in number in accordance with the smaller size of the blade. Otherwise there is no difference, except in the firmer consistency of the leaves. These differences may be due to the higher elevation and a more exposed habitat.

LASIANTHUS EUNEURUS, Stapf, n. sp. Frutex. Rami teretes, dense minuteque fulvo-tomentelli. Folia petiolo 3 lin. longo suffulta, oblonga, 3–$3\frac{1}{2}$ poll. longa, $1\frac{1}{4}$–$1\frac{1}{2}$ poll. lata, basi breviter acuta et sæpe leviter asymmetrica, apice *acuta*, *pergamacea*, supra nigro-fuscescentia, glaberrima, subtus in nervis minute denseque fulvo-tomentella, cæterum glaberrima, utrinque lucida, nervis lateralibus utrinque 7–8, longe prorsus arcuatis, in nervum marginantem collectis, secundariis paucis brevibus interjectis cum venis transversis numerosis atque *venulis utrinque gracillime excisis pulchre reticulantibus*. Stipulæ e basi triangulari subulato-acuminatæ, tomentellæ. Inflorescentiæ axillares ad flores paucos fasciculatos redactæ, sessiles vel brevissime pedicellatæ. Calyx breviter turbinatus, vix 1 lin. longus, tomentellus; limbus minute lateque 4-dentatus, deciduus. Corolla ignota. Bacca globosa, vix 2 lin. dimetiens, 4-sulcata, (exsiccata) nigra, hirtella, 4-pyrena.

At 7600 feet (*Haviland*, 1119).

Nearly allied to *L. acuminatus*, Wight, and *L. strigillosus*, Hook. fil., from the Western Peninsula, and perhaps also to *L. Wightianus*, Hook. fil., from Malacca; but the leaves are firmer than in the first two species and not really acuminate, and the reticulation is more prominent and exceedingly sharp. *L. Wightianus* has more numerous nerves and a distinct reticulation. Amongst the Malayan species *L. stercorarius*, Blume, comes nearest; *L. reticulatus*, Blume, which evidently is also nearly allied, I do not know, except from the description, but it is said to have rather large acuminate leaves.

LASIANTHUS ROTUNDATUS, Stapf, n. sp. Frutex subglaber. Rami nigricantes, glaberrimi, teretes, *internodiis vix $\frac{1}{2}$ poll. longis*. Folia petiolo 1–$1\frac{1}{2}$ poll. longo suffulta, late ovata, $1\frac{1}{2}$–2 poll. longa, 1–$1\frac{1}{2}$ poll. lata, *basi late rotundata vel subcordata*, apice acuta vel apiculata, coriacea, utrinque lucida, nigro-fuscescentia, subtus in nervis et in margine incrassato sparse hirtella vel glabra, nervis lateralibus utrinque 5, arcuatis, in nervum marginantem collectis, venis transversis numerosis crassiusculis venulisque reticulantibus utrinque prominulis. Stipulæ triangulares, breves. Inflorescentiæ *valde abbreviatæ*, 1–2 lin. longæ (floribus exclusis), sæpe nodiformes, subhirtellæ; alabastra pro parte mox decidua vel abortiva, cicatrices relinquentia numerosas; flores perfecti pauci, sessiles vel brevissime pedicellati. Calyx cupulari-

turbinatus, $1\frac{2}{3}$ lin. longus, sparse pilis minutis aspersus; limbus *latissime brevissimeque 4-dentatus*, ciliolatus. Corolla parce pilosula; tubus latiusculus, $1\frac{2}{3}$ lin. longus, fauce villosulus; lobi 4, ovati, 1 lin. longi. Stamina 4, fauci inserta, exserta; filamenta nigra, crassiuscula, $\frac{2}{3}$ lin. longa; antheræ oblongo-ellipticæ, $\frac{1}{2}$ lin. longæ. Stylus longitudine tubi corollini; stigma 3–4-lobum. Ovarium 4-loculare. Bacca subglobosa, 4-loba, $2\frac{1}{2}$ lin. longa, calycis limbo dentibus plerumque delapsis coronata; pyrenæ 4, crustaceæ, secundum angulum internum excavatæ.

At 8300 feet (*Haviland*, 1141).

Nearest allied to *Lasianthus venulosus*, Wight, but distinct by the rounded or even subcordate base of the crowded leaves, shorter inflorescences, and very short calyx-teeth. On the other side it is allied also to *L. euneurus*, which has very similar fruits.

NERTERA DEPRESSA, Banks, in Gaertn. Fruct. i. 124, t. 26.

Creeping in jungle at 10,500 feet (*Haviland*, 1075).

Distribution: South and Central America, from the Falkland Islands and Patagonia to South Mexico; islands of the South Sea to Tasmania and Victoria; New Zealand; Hawaii; Malayan Archipelago to Sumatra and the Philippines.

I think the Philippine plant (*Cuming*, 943), as well as the specimens from Java (Mt. Malabar, 7000 feet, *Anderson*, 193; *Horsfield*, 779; Merapi, 3700–4000 feet, *Junghuhn*), must be referred to *N. depressa*, though they differ at the first glance more or less—but not more than do the specimens from New Zealand or those from Tristan d'Acunha.

COPROSMA CRASSICAULIS, Stapf, n. sp., ♂ ♀. Frutex diœcus, prostratus, 4 ped. altus, *glaberrimus*. Rami *obtuse tetragoni*, novelli nigricantes, crassiusculi, annotini badii vel fusci, ad $\frac{1}{4}$ poll. crassi. Folia subsessilia, *oblonga vel obverse lanceolata*, $\frac{3}{4}$–$1\frac{1}{4}$ poll. longa, 4–5 lin. lata, basi breviter vel longius attenuata, apice acuta vel apiculata, coriacea, nigricantia, subtus pallidiora et sublucida, in margine anguste arcteque revoluta, nervis lateralibus utrinque circiter 5–6, tenuibus, supra impressis, subtus prominulis, vel utrinque indistinctis, venis nullis. Stipulæ *ovatæ*, $1\frac{1}{2}$ lin. longæ, obtusæ, crasse fimbriatæ, fimbriis minute ciliatis, albidæ. Flores singuli, ad apices ramulorum interdum valde abbreviatorum subsessiles. Flos masculus: Calycis tubus subnullus; lobi 4, triangulares, basin versus interdum denticulo aucti, vix $\frac{2}{3}$ lin. longi. Corollæ tubus brevis latusque, $1\frac{1}{4}$ lin. longus; lobi 4, oblongi, 3 lin. longi, demum revoluti. Stamina 4, longe exserta, libera; filamenta gracilia, 5 lin. longa; antheræ pendulæ, lineares, $2\frac{1}{2}$ lin. longæ, basi bilobæ, apice apiculatæ. Stylus rudimentarius, minimus, bifidus, vix $\frac{1}{2}$ lin. longus. Flos femineus: Calycis tubus breviter ovoideus, $\frac{1}{2}$ lin. longus, dentibus 4, brevibus, e basi triangulari linearibus, æquilongis, plerumque basin versus denticulo auctis. Corollæ tubus *brevis*, superne sensim ampliatus, $1\frac{1}{2}$ lin. longus; lobi ovati, æquilongi, demum recurvi. Stamina 4, effeta, libera, inclusa; filamenta $\frac{1}{4}$–$\frac{1}{2}$ lin. longa; antheræ ovatæ, basi bilobæ, apice apiculatæ. Stylus basi ad $\frac{4}{5}$ lin. indivisus, crassiusculus, tunc bifidus; stigmata minute papillosa, filiformia, flexuosa, 10 lin. longa. Bacca ellipsoidea, 2 lin. longa, calyce persistente coronata.

Pakapaka, 10,500 feet (*Haviland*, 1073); "on the top of the mountain" (probably at 13,000 feet) (*Low*).

Miquel described a species from East Java (10,000–11,000 feet) under the name of *Coprosma sundana*, which may be very near to *C. crassicaulis*; however, I have not seen a specimen of it, and I find his description too incomplete to enable me to recognize the species from it. Besides, he says "folia subtus venoso-reticulata," which certainly is not the case in the Kinabalu plant. This belongs to a group of species which is represented in New Zealand by *C. fœtidissima*, Forst., and *C cuneata*, Hook. fil., and in South-east Australia by *C. nitida*, Hook. fil., but without approaching to them so closely as the following species.

COPROSMA HOOKERI, Stapf, n. sp. Frutex humilis prostratus, ramosissimus, *glaberrimus*. Rami *tetragoni*; *internodia brevia*, in veterioribus circiter 1–2 lin. longa, *in ramulis brevissima*, 1 *lin. longa, pro maximâ parte stipulis plus minusve persistentibus obtecta*. Folia subsessilia vel petiolo ad 1 lin. longo tenui suffulta, *oblonga vel lanceolato-oblonga*, 4–6 lin. longa, 1½–2 lin. lata, acuta, coriacea, nigricantia, subnitida, nervis venisque inconspicuis. Stipulæ firmæ, albidæ, breviter *triangulari-ovatæ*, 1–1½ lin. longæ, crasse breviterque fimbriatæ. Flores solitarii vel masculi bini ad apices ramulorum. Flos masculus: Calyx tetragono-turbinatus, breviter 4-dentatus, 1 lin. longus, dentibus minute ciliatis. Corollæ tubus breviter infundibuliformis, 1–1½ lin. longus; lobi ovati, æquilongi, recurvi. Stamina 4, exserta, libera; filamenta 2½ lin. longa; antheræ oblongæ, 2½–2¾ lin. longæ, basi bilobæ, apice apiculatæ. Styli rudimentarii minimi 2. Flos femineus: Calycis *tubus ovoideus*, 1 lin. longus; limbus 4–5-dentatus, dentibus triangularibus, subæquilongis. Corolla infundibuliformi-campanulata, 2¼ lin. longa, ad medium 4–5-loba. Stamina 4–5; filamenta brevia; antheræ effetæ, lineares, 1½ lin. longæ, basi bifidæ, apiculatæ. Styli 2, a basi liberi, lanceolato-acuminati, 4 lin. longi, minute papillosi. Bacca ellipsoidea, 2–2½ lin. longa, calyce persistente coronata.

In crevices near the top of Mt. Kinabalu, alt. 13,000 feet (*Haviland*, 1072).

Nearly allied to *C. nitida*, Hook. fil., from Victoria and Tasmania, and to *C. cuneata*, Hook. fil., from New Zealand, the Auckland Group, and Campbell Island, and of a very similar habit. But in *C. nitida* the branches are constantly covered with a very fine, almost velvety tomentum (the plant is not glabrous as stated in Benth. Fl. Austral. iii. 430), the internodes are longer and are soon deprived of their deciduous and very short stipules, and the flowers are of a somewhat different shape. *C. cuneata*, on the other hand, differs chiefly in the terete branches, very short and truncate stipules, smaller obovate or obversely lanceolate leaves, and very slender tube of the female corolla.

COMPOSITÆ.

GNAPHALIUM LUTEO-ALBUM, Linné, Spec. Plant. 851; var. MULTICEPS, Hook. fil., Fl. Br. Ind. iii. 288.

In rice-fields at Kiau, alt. 2500 feet (*Burbidge*).

Distribution (of species): Almost cosmopolitan.

I am not able to distinguish *Gnaphalium Junghuhnianum*, Miq., and *G. Reinwardtianum*, Miq., from this form.

Dichrocephala latifolia, DC. in Guill. Archiv. Bot. ii. 518.

Bed of Dahombang River, alt. 3000 feet (*Haviland*, 1274).

Distribution: A weed, widely spread throughout the Tropics of the Old World.

CAMPANULACEÆ.

Pratia borneensis, Hemsley in Hook. Ic. Pl. t. 1532.

——, var. grandiflora, Stapf, n. var. Racemi robustiores, 2–3 poll. tantum longi, Calycis lobi latiores, ad 4 lin. glabri. longi. Corolla duplo major, lilacina.

On the Dahombang River, alt. 3000 feet (*Haviland*, 1309).

Distribution (of species): North Borneo.

The general habit and the structure of the flower agree so perfectly with the plant on which the species was founded that I prefer to describe the Kinabalu specimen rather as a variety than as a species, though the flowers are twice as large.

Pentaphragma aurantiaca, Stapf, n. sp. Caulis imprimis apicem versus asperulus. Folia petiolo 1–1$\frac{3}{4}$ poll. longo asperulo suffulta, oblique lateque ovata, 5 poll. longa, 3$\frac{1}{2}$–4 poll. lata, basi inæqualiter rotundata vel subcordata, serrulata, membranacea, supra glaberrima, subtus asperulo-papillosa, septempli-nervia, venis venulisque utrinque prominulis. Cymæ axillares, breviter pedunculatæ, cernuæ; bracteæ infimæ 4–6 lin. longæ, late ovatæ, flores arcte congestos involucrantes; interiores minores grosse papillosæ; pedicelli subnulli. Calyx *campanulatus*, 1 *poll. longus*; tubus subvillosus; lobi glabrati, oblongi, obtusiusculi, 5–6 lin. longi. Corolla *aurantiaca*, $\frac{1}{2}$ poll. longa, e calyce breviter exserta; segmenta late obovata, apiculata. Stamina circa stigma sulcatum conniventia et cohærentia 1$\frac{1}{2}$ lin. longa; antheræ muticæ.

At 6000 feet (*Haviland*, 1227).

Very well marked by the large campanulate calyx, which becomes wider after flowering (to $\frac{1}{2}$ inch in dried specimens), but not much longer, and by the orange-coloured corolla. There are three species described of this genus, and one or two more might be added from the material in the Kew Herbarium. They are distributed from the Malay Peninsula to New Guinea.

Campanumœa celebica, Blume, Bijdr. 727.

On the side of torrents, Tampassuk Valley, alt. 2500 feet (*Haviland*, 1358).

Distribution: Malayan Archipelago, eastward as far as Celebes; Indo-China to Chittagong and the Sikkim Himalaya.

ERICACEÆ.

VACCINIUM CORIACEUM, Hook. fil., in Hook. Ic. Pl. t. 892.

At 9000 feet (*Low; Haviland*, 1132).

According to Dr. Haviland, the calyx and corolla are pink.

VACCINIUM BUXIFOLIUM, Hook. fil., in Hook. Ic. Pl. t. 891.

From 7500 to 11,800 feet (*Low; Haviland*, 1083, 1084).

The corolla is not always distinctly ventricose, but often tubular, as in *V. coriaceum*; it is, however, larger than in that species (to 3 lin.). The anthers are spurred or spurless, and the style is slightly hairy at the base.

VACCINIUM, sp. near *V. varingiæfolium*, Miq.

A bush or small tree, at the Penokok, alt. 3000 feet (*Haviland*, 1324).

This is probably different from *V. varingiæfolium*, but the material is too incomplete for description.

VACCINIUM PACHYDERMUM, Stapf, n. sp. Frutex erectus, inflorescentiâ et gemmis exceptis glaber. Rami crassiusculi. Folia superne congesta, petiolo crasso 1–3 lin. longo suffulta, *obovata vel rotundato-obovata*, 2–4 poll. longa, 1–2 poll. lata, basi subabrupte vel longiuscule in petiolum attenuata, apice late rotundata, crasse coriacea, subtus glandulose-punctata, margine acuto subrecurvo, *nervis lateralibus utrinque circiter* 5, angulo 30° ortis, laxe reticulatim venosa, nervis venisque prominulis. Racemi axillares, 1½ poll. longi, *cinereo-hirtelli*; bracteæ oblongæ vel obovato-oblongæ, 3 lin. longæ, mox deciduæ, *minute hirtellæ*, deinde glabratæ, ciliatæ; pedicelli curvati, demum 4–6 lin. longi. Calycis tubus ovoideo-hemisphæricus, 1–1¼ lin. longus, hirtellus, *dentibus* 5 *rotundato-ovatis vel ovatis*, ½–¾ lin. longis, ciliatis. Corolla (ex alabastris tantum nota) subglabra. Filamenta pilosa; antheræ oblongæ, appendicibus tubulosis, dorso minute 2-spinulosæ. Stylus crassiusculus, basi hirtellus. Bacca (submatura) globosa, 3 lin. dimetiens, vertice inter calycis dentes persistentes valde convexo, protruso, hirtello.

In barren and stony open places, alt. 10,500 feet; Maripari Spur, alt. 5500 feet, in flower only. (*Haviland*, 1140, 1264.)

Allied to *V. arbutoides*, Clarke, from the Patkoi Range in North Burma, and in a minor degree to *V. Teysmannii*, Miq., from Java, but distinct by the few nerved obovate leaves, and also from *V. arbutoides* by the short broad calyx-teeth and from *V. Teysmannii* by the indumentum.

VACCINIUM CORDIFOLIUM, Stapf, n. sp. (Pl. XV. D. 7–11.) Frutex. Rami dense patuleque albo- vel cinereo-pilosi. Folia *valde approximata, internodia* ½–¾ poll. longa *multo superantia ideoque laxe imbricata, subsessilia vel petiolo crasso* 1–1½ lin. longo piloso *suffulta, e basi auriculato-cordata ovata*, ¾–1¾ poll. longa, ¾–1¼ poll. lata, acuta vel obtusiuscula, coriacea, primo utrinque albo–pilosa, mox glabrata, supra lucida, nervis lateralibus 4–5, cum venulis laxe reticulantibus utrinque prominulis. Racemi ex

axillis summis, interdum pseudo-terminales, singuli vel pauci, 2–2½ poll. longi, dense patuleque albo- vel cinereo-hirtelli; bracteæ ovatæ, 5–4 lin. longæ, foliaceæ; pedicelli nutantes, 4–6 lin. longi. Calycis tubus albo- vel cinereo-hirtellus; lobi late ovati, 1½ lin. longi, pilosi, minute ciliati. Corolla pallide rosea, glaucescens, glabra, ovato-tubulosa, 5 lin. longa; lobi 5, brevissimi, late ovati, recurvi. Filamenta e basi triangulari subulato-attenuata, 3 lin. longa, pilosa; antheræ oblongæ, 1 lin. longæ, appendicibus æquilongis, sparse glandulose pilosulæ, postice bispinulosæ. Stylus 4 lin. longus, crassus, ad ⅔ pilosus. Ovarium 5-loculare. Bacca calyce majusculo coronata, globosa, 3 lin. dimetiens, alba.

From 8800 to 9000 feet (*Haviland*, 1133, 1134, 1148).

A very remarkable species, which is nearest allied to the Polynesian species *Vaccinium cereum*, Forst. The densely crowded foliage gives it quite a singular appearance, not unlike that of certain specimens of *Gaultheria oppositifolia*, Hook. fil.

VACCINIUM, sp. near *V. Teysmannii*, Miq.

At 8800 feet (*Haviland*, 1107).

This is very probably a new species, but the material appears to me insufficient for description. The leaves are very coriaceous and not unlike those of *V. Teysmannii*, but they are almost sessile and their nervation is more prominent and of a slightly different character; the racemes are stiff and upright, 2–3 in. long, and the young fruits ovoid, crowned by short ovate and ciliate calyx-lobes, usually with a few black glands on the margin. I have seen but one deformed flower.

VACCINIUM MICRANTHERUM, Stapf, n. sp. Arbor humilis, inflorescentiâ exceptâ glabra. Ramuli graciles. Folia subsessilia, ovato-lanceolata, 2–2½ poll. longa, 10 lin. lata, basi late cuneatim attenuata, apice longiuscule acuminata, *tenuiter coriacea*, nervis lateralibus utrinque 2, rarius 3, fere e basi ad vel ultra medium prorsus ductis, superne circiter 3 utrinque additis, angulo 30° ortis, reticulato-venosa, nervis venisque leviter prominulis. Racemi ex axillis superioribus orti, 2-pollicares, graciles; bracteæ cito deciduæ, e cicatricibus probabiliter minutæ; pedicelli 3 lin. longi, recurvi vel patuli, plus minusve hirtelli. Calycis tubus breviter cupularis, vix ½ lin. longus, *cinereo-hirtellus*; lobi late triangulares, ciliatuli. Corolla ovato-tubulosa, 3 lin. longa, ore parvo, intus inferne sericeo-pilosula; lobi minuti, erecti, minute ciliolati. Filamenta ½ *lin. longa*, pilosa; antheræ breviter lineari-oblongæ, ⅓ *lin. longæ*, appendicibus tubulosis dimidio brevioribus, postice minute bispinulosæ. Stylus crassiusculus, ad medium hirtellus, 2½ lin. longus. Ovarium vertice hirtello.

At 3500 feet (*Haviland*, 1296).

Allied to *V. Hasseltii*, Miq., but differing considerably in the small anthers and the short filaments, and also in the hairy calyx and the much thinner leaves.

GAULTHERIA BORNEENSIS, Stapf, n. sp. (Pl. XV. c. 4–6.) Fruticulus, 2 pedes altus, glaberrimus. Ramuli graciles. Folia subsessilia, obovato-oblonga vel breviter oblanceolata, 4–5 lin. longa, 1½–2 lin. lata, basi et apice acuta, margine utrinque sub recurvo, minute glanduloso-denticulata, denticulis 4–6, coriacea. Racemi ex axillis

superioribus vel summis orti, sæpe pseudo-terminales, 1–1½ *poll. longi*; bracteæ late ovatæ, vix 1 lin. longæ, diu persistentes; pedicelli cernui, ad medium vel supra *bibracteolati*, 3 lin. longi. Calyx fere ad basin 5-partitus; segmenta ovata, ¾ lin. longa. Corolla alba, ovato-tubulosa, 3 *lin. longa*, dentibus porrectis minutis. Filamenta 1 lin. longa, linearia; antheræ ovatæ, 1 lin. longæ, asperulæ; loculi poro apicali dehiscentes, uterque appendicibus 2 setaceis, reflexis, patulis ornatus. Ovarium globosum, 5-lobatum, ut stylus glabrum. Capsula baccata, alba.

At 12,000 feet (*Haviland*, 1085).

Very similar in habit and foliage to *Gaultheria antipoda*, Forst., but distinct by the comparatively long racemes, the bibracteolate pedicels and larger flowers.

Diplycosia chrysothrix, Stapf. (Pl. XIV. E. 10–14.) Frutex epiphyticus. Rami graciles, *dense pilis aureo-rufis* demum cinerascentibus *setoso-hirsuti*. Folia petiolo ½–¾ lin. longo suffulta, *ovata*, 8–10 *lin. longa*, 5–6 *lin. lata*, basi rotundata, apice acuta, coriacea, subtus plerumque leviter concava, supra glaberrima, lucida, subtus et imprimis in margine setosa, nervis utrinque 1–2, supra impressis, sæpius indistinctis. Flores solitarii vel pauci in foliorum axillis; *pedicelli densissime setoso-hirsuti*, 2–3 lin. longi, apice bibracteolati; bracteolæ parvæ, cupulatim connatæ. Calyx fere ad basin 5-partitus; segmenta ovata, 3 lin. longa, acuta, *extus densissime sericeo-hirsuta*, intus minute adpresseque pilosula. Corolla rosea, late *cupulari-campanulata*, 5 lin. longa, *glabra*; lobi late ovati, 1 lin. longi. Filamenta glabra, 1½ lin. longa; antheræ ovatæ, minute asperulæ, appendicibus rectis, paulo brevioribus, oblique apertis. Ovarium disco angusto cinctum, globosum, 5-lobatum, minute pilosulum; stylus 4½ lin. longus. Placentæ prope loculi basin ortæ, multi-ovulatæ.

At 6600 feet (*Haviland*, 1182).

Diplycosia rufa, Stapf, n. sp. (Pl. XIV. D. 8–9.) Frutex epiphyticus. Rami *dense patuleque rufo-setosi*, setis demum cinerascentibus. Folia brevissime petiolata, *ovata*, 1½–2½ *poll. longa*, 8–14 *lin. lata*, basi rotundata, acuminata vel acutissima, coriacea, supra glaberrima, nitida, infra et imprimis in margine rufo-setosa, nervis lateralibus utrinque paucis, basalibus plerumque supra distinctis. Flores axillares, solitarii vel pauci, fasciculati, e gemmis perulatis orti; *pedicelli densissime setosi*, 2–3 lin. longi, apice bibracteolati; bracteolæ cupulatim connatæ, extus dense setosæ. Calyx fere ad imam basin partitus; segmenta lanceolata, 3–3½ lin. longa, *extus densissime pilis aureo-rufis sericeo-hirsuta*, intus glabra. Corolla *angulato-campanulata*, 3½–4 lin. longa, ad ⅖ 5-lobata; tubus inferne et in commissuris glaber; *lobi* ovati, acuminati, *extus rufo-hirsuti*. Stamina sæpe post corollam delapsam persistentia; filamenta 1¼ lin. longa, glabra; antheræ ovatæ, 1 lin. longæ, minutissime asperulæ, appendicibus rectis æquilongis, apice poro oblique apertis. Ovarium disco lobulato cinctum, globosum, 5-lobatum, hirtellum; stylus 2 lin. longus.

From 7500 to 8000 feet (*Haviland*, 1137, 1181).

This and the preceding species are allied to *D. pilosa*, Blume, but very distinct in the dense and long shining indumentum of the bracts, pedicels, and calyces, and the coarser

hairs of the branches and leaves. Both species certainly are closely allied, but sufficiently distinct by the size and shape of the leaves and the shape and hairiness or glabrousness of the corolla. In both cases the flowering and the vegetative branches originate from perulate buds. The bud-scales are much smaller in *Diplycosia chrysothrix*, more hirsute, and almost hidden by the bristles of the stem.

Diplycosia ciliolata, Hook. fil. in Hook. Ic. Pl. t. 894.
From 6000 to 8000 feet (*Low*; *Haviland*, 1135).

Diplycosia myrtillus, Stapf, n. sp. Frutex. Ramuli graciles, novelli parce setulosi, *mox glabri*. Folia petiolo 1–1½ lin. longo suffulta, elliptico-oblonga, 5–7 *lin. longa*, 3 *lin. lata*, utrinque acuta vel apice mucronulata, *in margine indistincte crenulata vel integra et parce setulosa*, setulis mox deciduis, coriacea, supra lucida, subtus glanduloso-punctata, costâ supra impressâ, subevenia. Flores solitarii, rarius bini, axillares; pedicelli hirtelli, 2 lin. longi, basi minute bracteati, apice bibracteolati; bracteolæ ovatæ, basi connatæ, ½–¾ lin. longæ, ciliolatæ. Calyx ad medium 5-lobus, 1½ lin. longus; lobi ovati, acuti, ciliolati. Corolla campanulata, 3 lin. longa, fere ad medium 5-loba; lobi apice recurvi. Filamenta e basi ovatâ abrupte linearia, glabra, 1¼ lin. longa; antheræ ovato-lineares, ¾ lin. longæ, asperulæ, in appendices dimidio breviores, apice poro minuto apertos, abeuntes. Ovarium disco cinctum, globosum, apice hirtellum, cæterum ut stylus 3 lin. longus glabrum.
At 8700 feet (*Haviland*, 1136).

Diplycosia pinifolia, Stapf, n. sp. (Pl. XIV. a. 1–3.) Frutex glaberrimus. Rami nigro-fusci, graciles, dense foliati. Folia *juvenilia fere filiformia*, exsiccando nigricantia, *adulta anguste linearia*, 2–2½ poll. longa, ¾–1 lin. lata, basi in petiolum brevissimum attenuata, obtusiuscula, integerrima, coriacea, enervia. Flores axillares, solitarii vel geminati; pedicelli tenues, 2–3 lin. longi, apice bibracteolati; bracteolæ rotundatæ, ciliolatæ. Calyx 1 lin. longus; segmenta 5, ovata, acuta vel subacuminata, albo-ciliolata, apice recurva. Corolla (juvenilis) calyce vix longior, glabra. Disci glanduli 5, rotundi, ovarium cingentes. Filamenta glabra; antheræ ovatæ, in appendices tubulosos rectos abeuntes. Ovarium ovoideum, sparse pilis longis vestitum; stylus glaber; stigma minute bilobum.
At the Penokok, alt. 3500 feet (*Haviland*, 1297).
This is a species of very peculiar habit, if compared with the remainder of the genus, whilst it approaches nearest to *D. ciliolata*, Hook. fil., in its flowers.

Diplycosia heterophylla, Blume, Bijdr. 853 (?); (forma parvifolia, an species nova ?).
At 7600 feet (*Haviland*, 1146).
I have seen only fruiting branches. Some of the specimens of *D. heterophylla* (for instance *Beccari*, Pl. Sum. n. 243, and in a less degree a specimen collected by Lobb on Mt. Salak in Java), have, at least partly, leaves which approach those of Haviland's plant very closely, except that the latter are still more acuminate. The nervation, which is hardly visible in the Kinabalu specimens, seems to be of the same type as in *D. heterophylla*,

whilst the fruits agree perfectly. For these reasons I am rather inclined to regard the plant enumerated as a small leafy form of the variable *Diplycosia heterophylla*; but I must add that it differs from all specimens of *D. heterophylla* which I have seen in the very slender branches, the long acuminate leaves, and the solitary or sometimes paired flowers.

DIPLYCOSIA PUNCTULATA, Stapf, n. sp. Frutex, inflorescentiâ exceptâ glaber. Ramuli crassi, pallide badii, minute *nigro-glanduloso-punctati*. Folia petiolo crasso 4–6 *lin. longo* suffulta, elliptica, $2\frac{1}{2}$–3 poll. longa, $1\frac{1}{2}$–$1\frac{3}{4}$ poll. lata, basi breviter attenuata, apice acuta vel subacuminata, margine acuto subrecurvo, valde coriacea, *utrinque glandulis nigris punctata, nervis plerumque utrinque angulo* 70° *ortis*, infra marginem arcuatim collectis, supra impressis, infra prominulis, venis paucis. Flores 4–6, in fasciculis axillaribus et extra-axillaribus; pedicelli basi bracteâ parvâ suffulti, hirtelli, ad 2 lin. longi, apice bibracteolati; bracteolæ hirtellæ, late ovatæ. Calyx 2 lin. longus, glaber, nigricans, ad medium vel ultra 5-lobatus; lobi ovati, minute glanduloso-ciliolati. Corolla in alabastro angulato-ovata. Filamenta glabra; antheræ lineari-oblongæ, minute asperulæ, appendicibus multo brevioribus longitudinaliter fere ad basin apertis. Ovarium disco cinctum, globosum, 5-lobatum, ut stylus glabrum.

At 7000 feet (*Haviland*, 1202).

Also allied to *D. heterophylla*, Blume, and *D. scabrida*, Becc., but characterized by the longer petioles, the more numerous lateral nerves, and the copious glands, particularly of the young branches.

DIPLYCOSIA PENDULIFLORA, Stapf, n. sp. (Pl. XIV. C. 7.) Frutex glaberrimus. Rami graciles, pallidi. Folia petiolo crasso, supra sulcato, 3 lin. longo suffulta, *elliptica vel ovato-elliptica*, 6–7 *poll. longa*, $2\frac{1}{2}$–4 *poll. lata*, basi rotundata vel subcordata, abrupte acuminata, coriacea, infra nigro-punctata, nervis lateralibus utrinque circa 4–5 supra impressis, infra prominulis, in nervum a margine remotum collectis, venis paucis tenuibus. Flores solitarii vel gemini, *e ramulis orti, penduli*; pedicelli bracteis minutis suffulti, 1 *poll. longi, filiformes*, apice bibracteolati; bracteolæ ovatæ, basi connatæ, $\frac{1}{2}$–$\frac{3}{4}$ lin. longæ. Calycis fructus semimaturi tubus piriformis, carnosulus, $2\frac{1}{2}$ lin. longus; limbus 5-partitus; lobi ovati, minute glanduloso-ciliati. Capsula vertice glabra; stylus $1\frac{1}{2}$ lin. longus.

On Kinitaki River, alt. 5000 feet (*Haviland*, 1269).

Though the material is incomplete, I do not hesitate to describe this very remarkable species, the affinity of which lies evidently with *D. heterophylla*, Bl. It is strongly marked by the large leaves and the slender and long pedicels.

DIPLYCOSIA KINABALUENSIS, Stapf, n. sp. (Pl. XIV. B. 4–6.) Frutex *prostratus, paucos pollices altus*. Rami *crassiusculi*, glabri, teretes. Folia petiolo crasso, 2–3 lin. longo, suffulta, elliptica vel obovata vel oblonga, $2\frac{1}{4}$–$2\frac{3}{4}$ poll. longa, $1\frac{1}{4}$–$1\frac{1}{2}$ poll. lata, basi acuta, apice rotundato–obtusa, margine arguto subrecurvo, setoso-ciliata vel demum glabrata, coriacea, opaca, 5- vel rarius 7-plinervia, nervis infimis 2 fere ad apicem ductis,

2 sequentibus sub ipso apice cum costâ conjunctis, nervis superioribus venisque utrinque impressis, grosse reticulantibus. Flores extra-axillares, in ramulis annotinis solitarii vel pauci, fasciculati e gemmis perulatis; pedicelli 3–4 lin. longi, glabri, basi bracteati, apice bibracteolati; bracteolæ rotundato-ovatæ, 1 lin. longæ, ciliatæ. Calyx late cupularis, *fere 2 lin. longus*, fere ad basin 5-partitus; segmenta late ovata, glabra, ciliata. Corolla campanulata, virescens, $4\frac{1}{2}$ *lin. longa*, ad $\frac{2}{5}$ 5-lobata; lobi ovati, brevissime obtuseque acuminati, porrecti. Filamenta $2–2\frac{1}{2}$ lin. longa, in marginibus asperula; antheræ lineari-oblongæ, $1\frac{1}{2}$ lin. longæ, antice leviter incurvæ, asperulæ, in appendices tubulosos, apice oblique apertos, $\frac{1}{2}$ lin. longos attenuatæ. Ovarium disco cinctum, globosum, glabrum; stylus glaber, superne incrassatus, $2\frac{1}{2}$ lin. longus.

From 10,500 to 12,000 feet (*Haviland*, 1086).

According to Dr. Haviland the flowers are close to the ground.

Diplycosia urceolata, Stapf, n. sp. Frutex, inflorescentiis exceptis, glaberrimus. Folia petiolo crasso 3–6 lin. longo suffulta, *obovata vel obovato-oblonga*, 2–3 poll. longa, $1–1\frac{1}{4}$ poll. lata, *basi interdum longe in petiolum attenuata*, apice rotundata, margine acuto subrecurvo, coriacea, supra lucida, infra crebre nigro-punctulata, 5-plinervia, nervis infimis fere marginantibus versus apicem evanidis, sequentibus 2 sub apice ipso cum costâ connexis, supra impressis, infra prominulis, cæterum subevenia. Flores axillares et extra-axillares, in ramis annotinis 3–6 fasciculati; pedicelli hirtelli vel glabrati, 2–3 lin. longi, basi minute bracteati, apice bibracteolati; bracteolæ rotundato-ovatæ, ciliolatæ, $\frac{1}{2}$ lin. longæ. Calyx sub anthesi late cupularis, deinde paulo accrescens, turbinatus, ad $\frac{1}{2}$ 5-lobatus, $1\frac{1}{4}–1\frac{3}{4}$ lin. longus; lobi late ovati, ciliolati. Corolla *urceolata, vix 2 lin. longa*, 5-dentata, dentibus late ovatis, marginibus revolutis. Filamenta glabra, $\frac{3}{4}$ lin. longa; antheræ ovato-oblongæ, filamentis æquilongæ, asperulæ, in appendices brevissimos late apertos abeuntes. Ovarium globosum, ut stylus, glabrum. Capsula semimatura carnosula, turbinata, fere 3 lin. longa.

At 8000 feet (*Haviland*, 1150).

Diplycosia memecyloides, Stapf, n. sp. Frutex, inflorescentiis exceptis, glaber. Rami teretes, subgraciles. Folia petiolo 2–3 lin. longo suffulta, *late ovato-elliptica*, 2 poll. longa, $1–1\frac{1}{4}$ poll. lata, *basi rotundata vel brevissime attenuata, abrupte acuteque acuminata*, margine subplano, coriacea, exsiccata nigro-fusca, utrinque lucidula, *epunctata*, 5–7-plinervia, nervis 2 infimis usque ad acumen, sequentibus 2 fere ad apicem productis, tenuibus, prominulis, cæteris tenuissimis, rectis, utrinque 4–7. Flores axillares et extra-axillares, solitarii vel 2–3; pedicelli 2–3 lin. longi, hirtelli, demum glabrescentes, basi minute bracteati, apice bibracteolati; bracteolæ ovatæ, ciliolatæ, basi connatæ, $\frac{3}{4}$ lin. longæ. Calyx sub anthesi late cupularis, $1\frac{1}{2}$ lin. longus, ad $\frac{1}{2}–\frac{2}{3}$ 5-lobatus; lobi ovati, ciliolati. Corolla *tubuloso-campanulata*, 3 *lin. longa*, ad $\frac{1}{3}$ 5-lobata; lobi late ovati. Filamenta glabra, $1\frac{1}{4}–1\frac{1}{2}$ lin. longa; antheræ ovato-oblongæ, minute asperulæ, $\frac{3}{4}$ lin. longæ, in appendices dimidio

breviores, apice oblique apertos, attenuatæ. Ovarium disco angusto cinctum, globosum, apice pilosum; stylus glaber, superne incrassatus, vix 2 lin. longus.

At 6000 feet (*Haviland*, 1208).

DIPLYCOSIA CINNAMOMIFOLIA, Stapf, n. sp. Frutex glaber. Ramuli exsiccati, subangulati. Folia petiolo 3–4 lin. longo crasso suffulta, ovata vel oblongo-ovata, $2\frac{1}{4}$–$4\frac{1}{2}$ poll. longa, $1\frac{1}{2}$–2 poll. lata, basi rotundata vel leviter cordata, *sensim et sæpius longiuscule acuminata*, coriacea, supra sublucida, subtus nigro-punctata, 5-plinervia, nervis lateralibus 2 infimis ad $\frac{2}{3}$, sequentibus 2 fere ad apicem ipsum productis, cæterum fere evenia. Flores e ramulis annotinis extra-axillares, 3–6 fasciculati; pedicelli basi minute bracteati, hirtelli, 2–$2\frac{1}{2}$ lin. longi, apice bibracteolati; bracteolæ late ovatæ, basi connatæ, ciliolatæ. Calyx *turbinato-campanulatus*, glaber, vix $1\frac{1}{2}$ lin. longus, ad $\frac{1}{3}$ vel $\frac{1}{4}$ 5-lobatus; lobi rotundato-ovati, ciliolati. Corolla rosea, *urceolaris*, 2 *lin. longa*, *sub ore constricta*, dentibus ovatis brevibus. Filamenta $\frac{3}{4}$ lin. longa, glabra; antheræ æquilongæ, ovatæ, minute asperulæ, appendicibus brevissimis late apertis. Ovarium disco cinctum, globosum, 5-lobatum, ut stylus glabrum.

From 8000 to 9000 feet (*Haviland*, 1138).

RHODODENDRON LOWII, Hook. fil. in Hook. Ic. Pl. t. 883.

From 8000 to 10,500 feet (*Low*, *Burbidge*; *Haviland*, 1081).

Distribution: Owen Stanley Range, New Guinea, according to Sir F. v. Mueller.

The capsules are 1–$1\frac{1}{2}$ in. long and up to $\frac{1}{2}$ in. broad. The valves separate down to the base and come off at last. They are comparatively thin, but hard and woody, with a broad, pellucid, and wavy margin. Mr. Burbidge says in a note that the flower-clusters measure 12–14 in. in diameter, and that the shrub attains a height of from 10 to 30 feet.

RHODODENDRON CRASSIFOLIUM, Stapf, n. sp. Frutex epiphyticus, glaber. Rami crassiusculi, cortice cinerascente. Folia probabiliter dimorpha in innovatione quâque, inferiora alternantia delapsa cicatrices parvas relinquentia, summa 2 subopposita vel 3 inflorescentias subtendentia et innovationes novellas in axillis foventia, petiolo crassissimo 4 lin. longo suffulta, oblonga, 5–7 poll. longa, $2\frac{1}{2}$–3 poll. lata, basi auriculato-cordata, apice obtusiuscula, valde coriacea, glabra, costâ validâ, supra prominente, subtus canaliculatâ. Rami floriferi brevissimi, crassi, dense cicatricibus perularum obsiti, pauciflori. Pedicelli $1\frac{3}{4}$ poll. longi. Calyx obsoletus, disciformis. Corolla *alba rubro-suffusa*, superne campanulata, $\frac{3}{4}$–1 *poll. longa*, ad vel paulo ultra medium 5-lobata; tubus brevis, cylindricus, intus, basi villosulâ exceptâ, glaber; lobi obovato-oblongi vel oblongi. Stamina 10; filamenta, e basi incrassatâ villosula, filiformia, 5 lin. longa; antheræ exsertæ, breviter obovatæ, 1 lin. longæ. Ovarium glabrum, breviter cylindricum, 5-loculare, in stylum fere $\frac{1}{2}$ breviorem attenuatum; stigma dilatatum.

On Kinitaki River, alt. 5000 feet (*Low*).

Allied to *Rhododendron Lowii*, but the flowers reddish white and much smaller. There are 4 flowers with the specimen, 3 of them detached. It appears to me, from the scars on the axis of the inflorescence, that there were not more on it.

RHODODENDRON BROOKEANUM, Low, ex Lindl. in Journ. Hort. Soc. iii. (1848) p. 42.

"A lanky shrub, growing on a tree-fern, but taller than it," at 7800 feet (*Haviland*, 1149).

Distribution: North Borneo.

RHODODENDRON STENOPHYLLUM, Hook. fil. ex Beccari, 'Malesia,' i. 203. Burbidge, 'The Gardens of the Sun,' 275, with fig. on p. 274. Frutex glaber, 2-4 ped. altus. Rami graciles. Folia dimorpha, *persistentia*, intervallis 1–2 poll. longis congesta, numerosa (ad 15), partim subverticillata, *angustissime lineari-lanceolata vel linearia*, $1\frac{1}{2}$–$2\frac{3}{4}$ poll. longa, 1–2 lin. lata, basi in petiolum brevissimum attenuata, acuta vel interdum fere setaceo-acutata, coriacea, sparsissime lepidota, uninervia; *decidua* pauca ad basin interstitiorum, pauca alia æqualiter inter persistentia distributa, submembranacea, scariosa, vel superiora in folia persistentia abeuntia, lanceolata, acuta vel subulato-acuminata. Inflorescentia terminalis e gemmis perulatis aphyllis, pauciflora, ut videtur plerumque 2-flora. Perulæ circiter 6–8, subæquilongæ, ovatæ, 6–8 lin. longæ, glabræ, tenues. Pedicelli crassiusculi, 3 lin. longi, glabri. Calyx obsoletus, disciformis. Corolla coccinea, superne campanulata, 1 *poll. longa*, ad fere medium 5-loba; *tubus brevis, latiusculus*; lobi obovati. Stamina 10; filamenta 5–6 lin. longa, basi pilosula; antheræ oblongæ, 2 lin. longæ. Ovarium cylindricum, $2\frac{1}{2}$ lin. longum, dense albo-tomentellum, 5-loculare; stylus 3 lin. longus; stigma dilatatum.

In very shady, mossy places, from 5000 to 8000 feet (*Low, Burbidge; Haviland*, 1104).

Closely allied to *R. salicifolium*, Becc., but differing in the very narrow leaves and smaller corollas with a wider tube. The specimens collected by the three gentlemen mentioned are very uniform. The sequence of the leaves is very remarkable, though typically the same as in the other species of § *Eu-Rhododendron.* Sir Hugh Low's specimens as well as Haviland's were collected in the spring. At this time all branches terminate with a cluster of persistent leaves which correspond to the "Sommerblätter" of *R. ponticum* (Maximowicz), and surround a very young bud. To judge from the dried material, these buds grow out during the following season into young branches of 1–2 in. in length, shifting the inner bud-scales along with them, till at a certain time the normal leaves appear in great numbers, terminating the growth of that season. What the length of that period is I do not know, but it seems very probable that more than one shoot is formed every year. The branches may grow for several consecutive periods without lateral ramifications, but when these are formed they always spring from the axils of "summer leaves," and in a very limited number (2–1). The membranaceous or scarious leaves pass into the summer leaves sometimes through one or two intermediate leaves, but more often they follow each other abruptly. Different as *R. stenophyllum* may seem if compared with *R. javanicum*, they yet belong to the same group.

RHODODENDRON RUGOSUM, Low, ex Hook. fil. in Hook. Ic. Pl. t. 885.

From 7000 to 10,000 feet (*Low, Burbidge; Haviland*, 1139).

The capsules are cylindric, about 6 lin. long, and densely pubescent. The valves separate to the base, but they do not twist or recurve.

RHODODENDRON ACUMINATUM, Hook. fil. in Hook. Ic. Pl. t. 886.

From 6000 to 8000 feet (*Low*).

RHODODENDRON DURIONIFOLIUM, Beccari, 'Malesia,' i. 202.

Terrestrial or epiphytic, from 4000 to 7000 feet (*Low, Burbidge; Haviland*, 1163, 1298).

Distribution: North-west and North Borneo.

A specimen collected by Low, and named *R. polyanthum* in MS. by Sir Joseph Hooker, has some leaves much larger than most of the other specimens have, the largest measuring 7 in. by 2½, but there is no other difference. One of Dr. Haviland's branches has leaves of an intermediate size.

RHODODENDRON LACTEUM, Stapf, n. sp. (§ *Eu-Rhododendron*). (Pl. XV. A. 1–2.) Frutex epiphyticus. Rami *dense cinereo-tomentello-hirtelli*. Folia alternantia vel verticillata, sessilia, *lineari-oblonga*, 1–1¾ poll. longa, ¼–½ poll. lata, basi rotundata, apice obtusa, margine recurvo, coriacea, *supra minutissime hirtella*, sublucida, *subtus in costâ longius, cæterum brevissime sparseque hirtella*, subuninervia. Inflorescentia terminalis, e gemmâ perulatâ aphyllâ, multiflora. Perulæ minute sericeo-tomentellæ. Pedicelli 3–4 lin. longi, sericeo-hirtelli. Calyx obsoletus. Corolla *alba*, hypocrateriformis; tubus subrectus vel rectus, 1½–2 poll. longus, *villosulus*; limbus 5-partitus; lobi oblongi, 8 lin. longi, 3–3½ lin. lati, glabri. Stamina 10; filamenta tenuissima, ad 3 lin. exserta; antheræ ovatæ, ¾ lin. longæ. Ovarium cylindricum, dense sericeo-pilosum, 3 lin. longum, 5-loculare; stylus sericeo-pilosulus, sub apice glaber, 2 poll. longus; stigma dilatatum; lobulatum.

Penokok, alt. 3500 feet (*Haviland*, 1295).

Allied to *R. jasminiflorum*, Hook. fil., but very distinct by the narrow leaves and the indumentum of the branches, leaves, and flowers.

RHODODENDRON VERTICILLATUM, Low, ex Lindley, Journ. Hort. Soc. iii. (1848), 86; Hook. fil. in Hook. Ic. Pl. t. 884.

Epiphytic or terrestrial on rocky banks of torrents, from 8000 to 11,500 feet (*Low; Haviland*, 1147).

Distribution: North-west Borneo (Mt. Penrisen) and North Borneo.

RHODODENDRON BUXIFOLIUM, Low, ex Hook. fil. in Hook. Ic. Pl. t. 890.

Found only at 12,000 feet, evidently very rare (*Low; Haviland*, 1080).

The capsules are oblong, ½ in. long, and sparingly covered with small scales. Both collectors state that they found it on one place only, and both give the elevation at 12,000 feet.

RHODODENDRON CUNEIFOLIUM, Stapf, n. sp. (§ *Fragrantes*). (Pl. XV. B. 3.) Arbor humilis. Ramuli *graciles*, novelli badii, demum albo-cinerascentes. Folia petiolo 1 lin. longo suffulta, *obovato-cuneata*, 6–8 *lin. longa*, *superne* 2 *lin. lata*, basi longe cuneatim in petiolum attenuata, apice rotundata, emarginata, margine leviter recurvo, impresso-punctata, coriacea, utrinque sparsim lepidota, supra demum glabrata, lucida, uninervia, costâ supra impressâ. Flores terminales solitarii vel bini e gemmâ perulatâ, ovoideâ, acutâ, 2 lin. longâ. Perulæ paucæ, ovatæ, exteriores breviores, sericeo-ciliatulæ. Pedicelli filiformes, 2 lin. longi, *dense lepidoti*. Calyx breviter 5-lobatus, lepidotus. Corolla rubra, *tubulosa*, *superne sensim leviterque dilatata*, 5 *lin. longa*, extus lepidota; lobi 1–1½ lin. longi, porrecti (an semper?), ovati, margine suberosuli. Stamina 10; filamenta filiformia, glabra, breviter exserta; antheræ ovato-globosæ, ½ lin. longæ. Ovarium dense lepidotum; stylus tenuis, glaber, 3 lin. longus.

At 7000 feet (*Haviland*, 1180).

Allied to *R. Vidalii*, Rolfe, *R. apoanum*, Stein, *R. rosmarinifolium*, Vid., and *R. quadrasianum*, Vid., but distinct by the very narrow cuneate leaves and the rather tubulose corolla. Of these I know *R. rosmarinifolium* only from Vidal's description; I have seen the other three. According to Vidal, *R. rosmarinifolium* differs by robust branches, oblong linear leaves, smaller bell-shaped flowers, and hairy pedicels. *R. apoanum* is a native of Mindanao, *R. quadrasianum* inhabits South and Central Luzon, whilst *R. Vidalii* (=*R. verticillatum*, Vidal, non Low) and *R. rosmarinifolium* were found in North Luzon. They all come very closely together.

RHODODENDRON ERICOIDES, Low, ex Hook. fil. in Hook. Ic. Pl. t. 887.

From 8000 feet almost to the top, very common at 10,500 feet (*Low*; *Haviland*, 1066): in sandstone grit and peat (*Burbidge*).

From 6 to 10 feet high at the lower limit, dwarfed (6 in.) at the higher elevations.

CLETHRA CANESCENS, Reinwardt, in Blume, Bijdr. 863.

In young jungle, Ulu Tawaran, alt. 2000 feet (*Haviland*, 1367).

Distribution: Java, Lombok, Celebes, North Borneo (Kulawat, alt. 2000 feet, *Lobb*!).

The species is represented by very closely allied forms in South China (*C. Faberi*, Hance) and in Luzon (*C. lancifolia*, Turcz.).

EPACRIDEÆ.

LEUCOPOGON MALAYANUS, Jack in Mal. Misc. I. v. 20.

Maripari Spur, alt. 5500 feet (*Haviland*, 1263).

Distribution: Malaya, on the mainland as far as Malacca, in the island of Phukok in South Cambodja, and from Sumatra to Borneo.

LEUCOPOGON SUAVEOLENS, Hook. fil. in Hook. Ic. Pl. t. 898.

From 7500 to 10,000 feet (*Low*); from 9000 to 13,000 feet (*Haviland*, 1062).

Distribution: North Borneo, Mindanao.

The leaves vary from linear oblong (3–4½ by 1½ lin.) to linear (5 by 1 lin.); but the venation is always the same.

MYRSINEÆ.

MÆSA INDICA, Wallich, in Roxb. Fl. Ind. ed. Carey & Wall. ii. 230 in notâ.

From 4000 to 5000 feet (*Haviland*, 1191, 1192, 1304).

Distribution: Tropical Asia.

MYRSINE CAPITELLATA, Wall. in Roxb. Fl. Ind. ed. Carey & Wall. ii. 295.

——, var. AVENIS, Clarke in Hook. fil. Fl. Br. Ind. iii. 512.

From 8000 to 11,500 feet (*Haviland*, 1090, 1151).

Distribution (of species): Himalaya, from Nepal to Bhotan, Khasia Hills, Silhet, Assam, Malay Peninsula and Archipelago, Hainan, Ceylon, and Western Peninsula to the Anamally Hills.

The Himalayan form, on which the species was founded, is very uniform in every respect, and some of the Khasia specimens approach it very closely, whilst others pass more or less into the common Malayan form, which was named *M. avenis* by De Candolle. Exactly the same veinless form occurs in Ceylon and in the Western Peninsula, where the more luxuriant specimens or low-region forms, however, are not inclined to develop leaves of quite the same shape as they do in the Khasia Hills, but a form which is more oblanceolate or obovate and which occurs in stunted specimens of the higher regions of the Khasia Hills. Quite similar forms occur in Borneo and the Philippines and in Hainan, but wherever the leaves are enlarged they maintain their very coriaceous consistency, the nerves never become so prominent as in the Himalayan or the common Khasia form, and the leaves are always widest in the upper third or fourth. The shape of the calyx-lobes and the length of the pedicels vary too much to afford a fixed character for specific distinction. The same seems to be the case with regard to the tetramery or pentamery of the flowers, as in the specimens from Kinabalu the flowers are 4- or 5-merous. Therefore, I think, *M. affinis*, DC., *M. Hasseltii*, Blume, and *M. borneensis*, Scheff., must be merged into *M. capitellata* v. *avenis*, and I doubt very much whether *M. densiflora*, Scheff., of which I have seen only a barren branch, can be kept up.

The Kinabalu specimens have exceptionally large fruits (3 by 2½ lin.) and very obtuse calyx-lobes. The flowers are always pedicelled and less numerous than they usually are in the variety *avenis*.

MYRSINE DASYPHYLLA, Stapf, n. sp. Frutex glaberrimus. Rami crassiusculi, cicatricibus foliorum et ramulorum floriferorum residuis obtecti, cortice nigricante, plus minusve late sulcati, superne, ut ramuli, *densissime foliati*. Folia *subsessilia*, spathulato-cuneata, $\frac{3}{4}$–$\frac{5}{4}$ poll. longa, 4–5 lin. lata, obtusa, *haud emarginata*, crasse coriacea, *supra glauco-viridia*, lucida, subtus opaca, glandulose punctata, uninervia, avenia. Flores pauci vel solitarii, sessiles, in ramulis axillaribus brevissimis, gemmis perulatis. Perulæ bracteæque minute glandulose ciliatæ. Calyx $\frac{5}{4}$ lin. longus, ad $\frac{2}{3}$ 4–5-lobatus; lobi obtusi, late ovati, minute papilloso-ciliati vel subglabri.

Corolla $1\frac{1}{2}$ lin. longa; tubus brevissimus; segmenta oblonga obtusa, demum reflexa, in margine intusque papillosa. Antheræ sessiles, basi corollæ segmentis adnatæ, $\frac{1}{2}$ lin. longæ. Ovarium ovoideum, apice annulatum; stylus $\frac{1}{2}$ lin. longus, irregulariter lobulatus. Fructus globosus, *apiculatus*, pallidus, 2 lin. dimetiens; stylus diu persistens.

At 11,000 feet (*Haviland*, 1065).

Nearly allied to *M. capitellata* v. *avenis*, Wall., and to *M. sumatrana*, Miq., but distinct from the former by the exceedingly dense foliage, the glaucous, sessile or subsessile leaves, and the sessile flowers; from the latter by the dense foliage, the leaves, which are not emarginate and not pellucid-dotted, the sessile flowers; and from both by the more apiculate fruits. The dense foliage is a very striking character, and has no parallel even in the most stunted specimens of *M. capitellata* I have seen, nor in those of *M. sumatrana*.

Myrsine, sp. affinis *M. achradifoliæ*, F. Muell.

Maripari Spur, alt. 5500 feet (*Haviland*, 1258).

There is but one branch with fruits in the collection. The stem and the leaves are exceedingly like those of *M. achradifolia* from Queensland. the only difference being in the petioles, which are 4 lin. long. in the Kinabalu plant, and 1 inch in *M. achradifolia*. The flowers are pedicelled as they are in this species, and the calyx also is very similar, but, perhaps, a little smaller. The fruits are comparatively small, almost depressed, globose, about $1\frac{1}{2}$–$1\frac{3}{4}$ lin. in diameter. As I do not know the flower of Dr. Haviland's plant, and as the fruit of *M. achradifolia* is unknown, I abstain from describing the Kinabalu plant as a new species.

Labisia pothoina, Lindley, in Bot. Reg. 31, t. 48.

From 3000 to 4000 feet (*Burbidge*).

Distribution: Malay Peninsula, from Singapore to Penang; from Sumatra to Borneo.

Embelia tortuosa, Stapf, n. sp. Frutex glaberrimus. Rami divaricati, exsiccati plus minusve irregulariter sulcati, cortice nigricante. Folia petiolo crasso 1–2 lin. longo suffulta, oblonga vel obovato-oblonga, $1\frac{1}{4}$–$1\frac{3}{4}$ *poll. longa*, $\frac{3}{4}$ *poll. lata*, basi rotundata, apice obtusa, rarissime subacuta, *crasse coriacea*, exsiccata supra fusco-olivacea, subtus ferruginea, *nervis lateralibus tenuissimis numerosis, sæpe indistinctis*, angulo 75°–90° ortis. Paniculæ terminales in *ramulis foliatis* 3–4 *poll. longæ*, $2\frac{1}{2}$–3 *poll. latæ*, *robustiores*, strictæ, subebracteatæ. Pedicelli 1–2 lin. longi. Calyx ad vel ultra medium 5-lobus, $1\frac{1}{4}$ lin. dimetiens; lobi ovati, obtusi vel acutiusculi, minute ciliolulati. Fructus globosus, vix 2 lin. dimetiens, styli basi persistente, apiculatus.

At 8800 feet (*Haviland*, 1113).

A very well-marked species, allied to *E. javanica*, A. DC.

Embelia coriacea, A. DC. in Trans. Linn. Soc. xvii. 135.

From 7600 to 8800 feet (*Haviland*, 1152).

Distribution: Malay Peninsula as far north as Penang; Archipelago from Sumatra to Borneo.

Beccari's specimens, nos. 767, 878, 1189, 3922, all from Sarawak, belong also to this species.

EMBELIA PHÆADENIA, Stapf, n. sp. Frutex. Rami ramulique *graciles*, novelli dense ferrugineo-hirtelli, *demum plus minusve glabrati*, cortice pallide badio. Folia petiolo 2 lin. longo suffulta, ovata vel ovato-oblonga, $\frac{3}{4}$–$1\frac{1}{4}$ *poll. longa*, interdum multo minora, basi rotunda vel breviter lateque acutata, apice obtuse acuminata, rarius obtusa, *sub apice pauci-crenata vel subintegra*, firme membranacea, *pallide viridia*, glanduloso-punctata, *glandulis luce permissâ rubiginosis*, nervis lateralibus primariis utrinque 5–8, secondariis interjectis cum venulis in reticulationem gracillimam, densissimam, utrinque prominulam intertextis. Racemuli axillares, pauciflori, sæpe 1–2-flori, 2 lin. longi; bracteæ minutæ, ferrugineo-furfuraceæ. Pedicelli *gracillimi*, $1\frac{1}{2}$ lin. longi. Calyx fere ad basin 4-partitus, $\frac{3}{4}$ lin. dimetiens; segmenta ovata subacuta, glandulosa et furfuracea vel glabrata. Fructus ellipsoideo-globosus, $1\frac{1}{2}$ lin. longus, pallide badius, sub vertice rubiginoso-glandulosus; stylus filiformis, $\frac{3}{4}$ lin. longus, diu persistens.

At 6000 feet (*Haviland*, 1203).

A very fine and distinct species, allied to *E. Gardneriana*, Wight, and *E. Myrtillus*, Kurz. The glands are most conspicuous in transparent light.

EMBELIA MINUTIFOLIA, Stapf, n. sp. Frutex. Rami ramulique dense ferruginei. Folia petiolo gracili 1 lin. longo vel breviore suffulta, *obovata*, 2 *lin. longa*, $1\frac{1}{2}$ *lin. lata, basi breviter cuneata, apice rotundata et minute crenulata*, coriacea, glabra, minute punctata, subenervia. Racemuli axillares, valde redacti, sæpe uniflori; rhachis ferruginea, brevissima, bracteata; bracteæ congestæ, minutæ. Pedicelli graciles, 1 lin. longi. Calyx fere ad basin 4-partitus; segmenta ovata, sub apice glanduloso-punctata, prætereaque minute glanduloso-ciliolata, $\frac{1}{4}$ lin. longa. Corolla ignota. Ovarium ovoideum, sparse glanduloso-pilosulum, in stylum $1\frac{1}{2}$-plo longiorem abiens. Bacca globosa, paulo ultra 1 lin. dimetiens.

At 8500 feet (*Haviland*, 1117).

Closely allied to *E. Myrtillus*, Kurz, but differing in the smallness of all parts and the shape of the leaves, probably also in the habit, for it seems to be of a stiffer and spreading growth.

EMBELIA SPIRÆOIDES, Stapf, n. sp. Frutex *glaberrimus*. Rami graciles, novelli badii, demum cinerascentes, lenticellis albidis conspersi. Folia *petiolo* 3 *lin. longo* suffulta, *elliptica, vel ovato- vel obovato-elliptica*, $\frac{3}{4}$–$1\frac{1}{4}$ poll. longa, 6–8 lin. lata, basi acutata, *apice obtusa vel rotundata*, rarius subacuta, *a medio ad apicem crenato-dentata*, coriacea, supra olivacea, subtus pallidiora, subglauca, et punctulis minutis prætereaque glandulis majoribus luce transmissâ vix rubiginosis notata, nervis lateralibus utrinque 7–8, cum venis venulisque in reticulationem densam, gracillimam,

utrinque leviter prominentem intertextis. Racemi axillares 5–12-*flori, rhachi* 2–4 *lin. longa*; bracteæ minutæ. Pedicelli graciles, 2 lin. longi. Calyx fere ad basin 4-partitus; segmenta ovata, $\frac{1}{2}$ lin. longa, glanduloso-punctata, haud ciliolata. Corolla fere ad basin 4-partita; segmenta obovato-oblonga, 1 lin. longa, glanduloso-punctata, minutissime ciliolulata. Stamina corollam subæquantia. Ovarium sparse glanduloso-papillosum, ovoideum, in stylum paulo longiorem abiens. Bacca globosa, apiculata, $2\frac{1}{2}$ lin. dimetiens, rubra, crebre glanduloso-punctata.

At 11,500 feet (*Haviland*, 1089).

This species belongs evidently to the same group as the two preceding species. It is very distinct by its glabrousness. The prefloration varies. The more frequent case is, one segment innermost, the other three overlapping to the left; then I found one segment outside, the opposite one inside, the lateral ones overlapped by the former and overlapping the latter. But in one case I observed a fifth smaller segment, and in this case there were two segments outside, two inside, and the fifth inside, overlapped perfectly by an outer and an inner segment. Upon these facts the prefloration hardly affords a good character for subdividing the genus.

Ardisia oocarpa, Stapf, n. sp. Arbor humilis, glaberrima. Ramuli superne ancipites. Folia petiolo crasso, alato, 3–1 lin. longo suffulta, lanceolata, 8–10 poll. longa, $2–2\frac{1}{2}$ poll. lata, basi in petiolum decurrentia, apice subacuminata, tenuiter coriacea, supra nigro-fuscescentia, nitida, subtus rubro-brunnea opaca, elevatim punctata, nervis lateralibus utrinque 25–30, angulo 50°–60° ortis, supra leviter impressis, subtus prominulis, indistincte venulosa. Panicula terminalis, laxa, interdum foliata, 5-7 poll. longa; rami inferiores racemose ramificati, superiores vel fere omnes simplices, umbelligeri, sursum curvati. Pedicelli demum semipollicares. Calyx fere ad basin 5-partitus; segmenta late ovata, acutiuscula, $1\frac{1}{2}$ lin. longa. Corollæ segmenta ovata, acuta, 2 lin. longa. Filamenta brevissima; antheræ $1\frac{1}{2}$ lin. longæ, acutæ. Stylus 2 lin. longus. Bacca *ovoidea vel ovoideo-globosa, apiculata,* $3\frac{1}{2}$–4 *lin. longa,* longitudinaliter striata, basi calyce arcte adpresso circumdata.

Penokok River, alt. 3000 feet (*Haviland*, 1317).

Very similar in habit to *A. paniculata*, Roxb., and *A. colorata*, Roxb., but very distinct by the large ovoid berries.

Ardisia brachythyrsa, Stapf, n. sp. Frutex glaberrimus. Rami robusti, novelli exsiccando nigrescentes, demum cinerascentes. Folia *subsessilia* vel *petiolo brevissimo crasso suffulta,* oblonga vel elliptica, 3–5 poll. longa, $1\frac{1}{2}–2\frac{1}{2}$ poll. lata, basi breviter attenuata vel subrotundata, brevissime acuteque acuminata vel acuta, margine subrecurvo, valde coriacea, supra lucidula, subtus minute nigro-punctata, nervis lateralibus angulo 70°–80° ortis, primariis utrinque 14–20, secundariis interjectis, arcuatim sub margine collectis, nervo marginali alio extero irregulariter undulato vel arcuatim fracto addito, grosse laxeque reticulata, nervis venisque utrinque prominulis. Panicula *terminalis* brevis, *pollicaris, cernua,* ramis umbelliferis vel corymbuliferis, 3–5 lin. longis. Pedicelli circa 3 lin. longi, recti vel sæpius

recurvi. Calyx ad vel ultra medium 5-lobus, $1\frac{1}{2}$ lin. dimetiens; lobi triangulares, minute ciliolati. Corollæ segmenta ovata, aristato-acuminata, 2 lin. longa; alabastrum acutum. Filamenta brevissima; antheræ subsagittatæ, apiculatæ, 1 lin. longæ. Stylus $1\frac{1}{2}$ lin. longus. Bacca subdepresso-globosa, $2\frac{1}{2}$ lin. dimetiens.

At 3000 feet (?) (*Haviland*, 1386).

I have not been able to identify this plant with any species in our Herbarium; but as we have no complete set of the Malayan species, as enumerated in Scheffer's 'Commentatio de Myrsinaceis,' I at first hesitated to describe it as a new species. However, the short, nodding, and truly terminal inflorescence, and the shortly petioled or almost sessile leaves, seem to distinguish it from any species which otherwise might come into consideration. Amongst these are *Ardisia lævigata*, Blume, *A. dingiensis*, O. Kuntze, and particularly *A. javanica*, A. DC.

Ardisia javanica, A. DC., Prodr. vii. 130.

At 8800 feet (*Haviland*, 1144).

Distribution: Malaya, from Sumatra (*Beccari*, 400) to Borneo.

Ardisia amabilis, Stapf, n. sp. Frutex glaberrimus. Ramuli graciles, subanfracti, lineis 2 elevatis notati. Folia *petiolo* 1–$1\frac{1}{2}$ *lin. longo* suffulta, *ovato-lanceolata*, $2\frac{1}{2}$–$3\frac{1}{2}$ poll. longa, 13–15 lin. lata, basi subrotundata vel breviter acutata, apice acuminata, subcoriacea, supra nigro-fuscescentia, opaca, elevatim punctata, subtus ferrugineo-fusca, nigro-punctulata, costâ utrinque prominente, *nervis lateralibus* 10–12 *tenuissimis*, angulo 60° ortis, evenia. Panicula terminalis, gracilis, nutans, 3 poll. longa; rami racemose ramificati; ramuli infimi 1–2-flori; superiores umbelligeri, corymbose dispositi. Pedicelli 2–3 lin. longi, graciles. Calyx fere ad basin 5-partitus 1 *lin. dimetiens*; segmenta ovata, acuta, minutissime ciliolata. Corollæ segmenta ovata, caudato-acuminata, $1\frac{1}{2}$ lin. longa, deflexa, rubro-glandulose-punctata; alabastrum acutum. Stamina erecta; filamenta brevia; antheræ sagittatæ, apiculatæ, vix 1 lin. longæ. Stylus antheras $\frac{1}{3}$ superans.

At 6000 feet (*Haviland*, 1211).

Allied to *A. Gardneri*, C. B. Clarke, and to *A. andamannica*, Kurz, but distinct by the very short petioles, the shape of the leaves, the very indistinct nervation, and the small calyx.

Ardisia virens, Kurz, For. Fl. Burma, ii. 575.

Shady jungle at Kiau (*Burbidge*); Penokok River, alt. 3500 feet (*Haviland*, 1315).

Distribution: Khasia Hills and Assam to South-west China; Borneo.

The berries are scarlet, and measure 4 lin. in diameter. The pedicels are slender, 9–14 lin. long, whilst the peduncles measure 4–15 lin. in Dr. Haviland's, and 6–12 lin. in Burbidge's specimens. The inflorescence is truly terminal. The leaves are crenulate, with glands between the crenæ. This character, as well as the truly terminal inflorescence, disagrees with the description of *A. virens*, Kurz, as given in Hooker's 'Flora of Brit. India,' but the very specimens quoted by Mr. C. B. Clarke also possess crenæ and truly

terminal inflorescences, though sometimes on short lateral and leafy branches. The fruits of the Bornean specimens are larger than any of *Ardisia virens* I have seen, but the difference is evidently within the range of individual or racial variation. *A. undulata*, Clarke, is partly at least identical with *A. virens*. Partly it seems to merge into *A. crenulata*, Roxb., whilst on the other hand *A. macrocarpa*, Wall., approaches also very much to *A. virens*. Yet, as *A. crenata* is very uniform over a wide area, including Malaya, Tropical China, and Japan, it seems to me better to retain it as a separate species, though closely connected with *A. virens*, which may or may not be merged into *A. macrocarpa*, and which is found from the Khasia Hills over Manipur and Assam to South-west China, and in a hardly distinguishable form in Borneo.

Ardisia villosa, Roxb., Fl. Ind. ed. Carey & Wall. ii. 274, forma glabrata.

On the Kadamaian, alt. 4500 feet (*Haviland*, 1242).

Distribution: Malaya, on the mainland as far as Mergui.

Ardisia oxyphylla, Wallich, Cat. n. 2291; A. DC. Prodr. viii. 130.

At 5000 feet (*Haviland*, 1212).

Distribution: Malaya, on the mainland as far as Tenasserim, Java, Borneo (Ceram ?).

I doubt very much whether this species can be separated from *A. polycephala*, Wall., which seems to be only a form with a stouter and richer inflorescence. In that case, the area would include also Burma up to Bamu and the Shan States.

EBENACEÆ.

Diospyros, sp. aff. *D. aureæ*, Hiern, Trans. Cambr. Philos. Soc. xii. pt. i. 206. ♂.

At 3000 feet (*Haviland*, 1322).

This is very probably a new species, differing from *D. aurea* by the longer flowers, which are caudate in the bud on account of the very tightly twisted lobes. The tube is ½ in. long, and but little longer than the lobes, which are reflected in the open flower. I found in the single good flower which I examined 14 glabrous stamens, arranged in two bundles of 3 and four bundles of 2 stamens each.

Diospyros, sp.

Small tree, on the Dahombang, alt. 3000 feet (*Haviland*, 1314).

This species is in habit very like *Diospyros pergamena*, Hiern. The flowers spring, according to Dr. Haviland, from near the base of the stem. But, as they are all deformed, I must refrain from describing or naming the plant.

STYRACEÆ.

Symplocos adenophylla, Wallich, Cat. n. 4427; C. B. Clarke, in Hook. fil. Flor. Br. Ind. iii. 575.

Maripari, 5500 feet to 7000 feet (*Haviland*, 1187–1256).

Distribution: Malaya, on the mainland to Penang, Java, Banca, Borneo.

S. iteophylla, Miq., and *S. bancana*, Miq., are synonyms of *S. adenophylla*, Wall. The

species is represented in the Kew Herbarium from Borneo by the following specimens:—Sarawak, *Lobb*; *Beccari*, 2115; and Lobong Peak, *Lobb*.

SYMPLOCOS LÆTEVIRIDIS, Stapf, n. sp. Frutex glaberrimus. Rami graciles, cortice badio. Folia petiolo *vix* 1 *lin. longo* subtus canaliculato suffulta, oblonga, 2–3 poll. longa, 1–1¼ poll. lata, basi plus minusve rotundata, longiuscule acuminata, basi exceptâ *argute serrata*, subpergamacea, læte viridia, nervis lateralibus utrinque circa 8, sub margine arcuatim collectis, nervo marginali alio arcuatim fracto addito, nervis venisque utrinque leviter prominulis. Flores subsessiles, in racemis axillaribus, gracilibus, paucifloris, ¾–1 poll. longis. Fructus ellipsoideus, purpureus, 4 lin. longus, *calycis lobis ovatis* obtusis, submembranaceis, 1 *lin. longis*, coronatus. Embryo subrectus.

At the Penokok, alt. 4000 feet (*Haviland*, 1320).

Very similar to *S. ramosissima*, Wall., from the Himalaya, but the leaves are very shortly petioled and more serrate, and the fruits are crowned by rather large calyx-teeth.

SYMPLOCOS DEFLEXA, Stapf, n. sp. Frutex. Rami ramulique dense fulvo-hirsuti vel hirtelli, demum glabrati, nigricantes. Folia petiolo 1 lin. longo, dense hirtello-tomentello suffulta, ovata vel ovato-oblonga, 1½–2 poll. longa, ¾–1 poll. lata, basi rotundata, *acute acuminata*, margine revoluto serrulato, subcoriacea, supra, costâ pilosulâ exceptâ, glaberrima, exsiccata sæpe olivaceo-fusca, subtus in nervis et in margine necnon in parenchymate fulvo-hirsuta, nervis lateralibus utrinque 5–7, supra tenuibus, subtus prominulis. Racemi pauciflori, in ramulis lateralibus terminales, folio summo breviores; præterea hinc inde flores solitarii ex axillis foliorum horumce ramulorum additi; rhachis cum pedicellis brevissimis hirtella. Fructus ovoideo-oblongus, 4 lin. longus, basi hirsutulus, cæterum glabratus, calycis lobis adpresse hirtellis vel glabratis, 1 lin. longis, coronatus. Embryo rectus.

At 8800 feet (*Haviland*, 1105).

SYMPLOCOS ZIZYPHOIDES, Stapf, n. sp. Frutex. Rami ramulique *divaricati, leviter anfracti*, primo adpressissime griseo-flavido-hirsuti, demum glabrescentes, brunnei. Folia petiolo ½–1 lin. longo, plerumque curvato, suffulta, ovato-oblonga, rarius ovato-lanceolata, 1–1½ poll. longa, ½ poll. lata, basi rotundata, *acuminata*, margine revoluto, serrulata, subcoriacea, supra exsiccando olivacea, glaberrima, subtus in nervis et in margine, nec non in parenchymate, adpresse flavido-griseo-hirsuta, nervis lateralibus utrinque 5, subtus tantum distinctis, tenuibus, prominulis. Flores *solitarii, axillares, in ramulis lateralibus*. Pedicelli adpresse hirtelli, 4–5 lin. longi, sub flore 2–3-bracteolati; bracteolæ minutæ. Calyx 1–1¼ lin. longus, adpresse hirtellus, ad medium lobatus; lobi rotundato-ovati, ciliati. Corolla alba, 5 lin. dimetiens. Fructus anguste ovoideo-oblongus, 5 lin. longus, calycis lobis exceptis glabratus.

At 10,500 feet (*Haviland*, 1088).

The inflorescence is, to speak strictly, a one-flowered raceme, but the racemose character is only slightly indicated by the minute bracteoles. The divaricate branches, which

are spread out in one plane and flexuose in zigzag, remind one of the habit of *Zizyphus Spina Christi*, *Z. Lotus*, &c.

SYMPLOCOS JOHNIANA, Stapf, n. sp. Frutex. Rami ramulique densissime subpatuleque ferrugineo-hirsuti. Folia petiolo 1 lin. longo, hirsuto suffulta, ovata, 1–2 poll. longa, 7–12 lin. lata, basi rotundata vel subcordata, *fere caudato-acuminata*, margine plano vel basin versus recurvo, serrato-dentata, subcoriacea, flavido-viridia, supra, costâ hirsutulâ exceptâ, glaberrima, lucidula, subtus in nervis necnon in margine (in foliis novellis densissime) hirsuta, nervis lateralibus utrinque 5–7, supra impressis, subtus prominentibus, 1–1½ lin. a margine eximie arcuatim collectis, supra evenia. Flores *solitarii, axillares, cernui*; *pedicelli brevissimi*, hirsuti, bibracteolati. Calyx 1 lin. longus, hirtellus; lobi rotundati. Corolla alba, 4 lin. dimetiens. Fructus purpureus, ovoideo-oblongus, 4 lin. longus, calycis lobis exceptis plus minusve glabratus.

At 6000 feet (*Haviland*, 1161).

These three latter species are nearly allied to each other, and at the same time also to *S. minor*, Clarke, from Ceylon, which they represent in Borneo. They all differ from *S. minor* by the acuminate leaves, and *S. Johniana* also by the almost sessile solitary flowers. *S. deflexa* approaches *S. minor* indeed very closely, and there is hardly any difference apart from the shape of the apex of the leaves. *S. zizyphoides* deviates more in the habit as well as in the complete reduction of the racemes to solitary flowers.

SYMPLOCOS BUXIFOLIA, Stapf, n. sp. Frutex, 8 ped. altus, glaberrimus. Rami ramulique robusti, *densissime foliati*, nigricantes. Folia petiolo 1–1½ lin. longo suffulta, obovato-elliptica, 6–7 *lin. longa*, 4–5 *lin. lata*, basi breviter attenuata, apice obtusa, sæpe rotundata, a medio denticulata, margine præsertim basin versus recurvo, coriacea, supra lucidula, olivaceo-fusca, costâ impressâ, subtus flavido-viridia, nervis lateralibus utrinque circiter 3 tenuibus prominulis. Flores *solitarii* in axillis foliorum summorum. Pedicelli (racemi rhachis reducti) *ad ½ poll. longi*, superne *pauci- vel pluribracteati*; bracteæ subfoliaceæ, obovatæ, vel summæ 3 florem subtendentes, plerumque lineari-oblongæ, 2–1½ lin. longæ, subpersistentes. Calyx fere 2 lin. longus; lobi rotundato-ovati minutissime ciliolati. Corolla 6 lin. dimetiens. Fructus lineari-oblongus, 6 lin. longus, calycis lobis coronatus.

Highest parts of Kinabalu, alt. 13,000 feet (*Low*).

A very remarkable species, allied to *S. bractealis*, Thw., from Ceylon, from which it differs by the smaller, very crowded leaves, and the reduced inflorescence.

APOCYNACEÆ.

LEUCONOTIS ANCEPS (?), Jack, in Trans. Linn. Soc. xiv. 121, t. 4. fig. 2 (an ejus varietas ?).

In young jungle on the Ula Tawaran, alt. 2000 feet (*Haviland*, 1365).

Distribution: Sumatra, Borneo.

In the Sumatran specimens of *L. anceps* the calyx-lobes are a little longer, the bracts

are also longer and more acute, and the inflorescence is more puberulous and richer. But these differences do not appear to me sufficient to justify the specific separation of Dr. Haviland's plant, of which I saw only one branch.

WILLUGHBEIA FIRMA, Blume, Mus. Bot. i. 154.—Syn. *W. Burbidgei*, Dyer, in Kew Report, 1880, pp. 44–46.

Near Koung and Kiau (*Burbidge*).

Distribution: Malaya, from Borneo to Sumatra, and in the Peninsula as far as Perak.

Burbidge's specimens in the Herbarium are marked "Lawas River," but there is a sketch and a note in his journal which make it pretty certain that the same species is also found at the base of Kinabalu. He states that it is a large climber, with golden yellow fruits and rather common, and that the Gutta hunters seem to obtain plenty of produce, as in most of the houses he was shown bundles of balls, some old and dry, having been kept two to three years, which the natives know very well improves them.

RAUWOLFIA SERPENTINA, Benth. in Benth. et Hook. fil. Gen. Pl. ii. 697.

——, var. GRACILIS, Stapf, n. var. Cymæ 4–5-floræ, graciliores, laxiores. Calycis lobi anguste lineares, elongati, $1\frac{1}{2}$ lin. longi.

At the Penokok, alt. 3000 feet (*Haviland*, 1346).

Distribution: Tropical Himalaya to Tenasserim; Ceylon to Travancore; Java.

Exactly of the habit of *R. serpentina*; but the inflorescence and the shape of the calyx-lobes, which I find very uniform in the Indian and Javanese specimens, differ slightly.

ALYXIA LUCIDA, Wall. in Roxb. Fl. Ind. ed. Wall. & Carey, ii. 540.

——, var. MEIANTHA, Stapf, n. var. Corollæ tubus $4\frac{1}{2}$ lin. longus, *i. e.* fere duplo longior quam in Wallichii exemplis.

At 7500 feet (*Haviland*, 1185).

Distribution (of species): Malaya, on the mainland to Perak, Sumatra, Java, Borneo.

A. quinata, Miq., from Sumatra, is identical with *A. lucida*, Wall.

ALYXIA, sp.

At 5000 feet (*Haviland*, 1184).

The material is too imperfect for determination. Dr. Haviland says it is a straggling shrub with white flowers.

PARAMERIA GLANDULIFERA, Benth. in Benth. et Hook. fil. Gen. Plant. ii. 715.

——, var. PHILIPPINENSIS, Stapf.—(Syn. *P. philippinensis*, Radlk. in Sitz. Ber. Bayr. Ak. Wiss. xiv. 518.)

At Kiau, alt. 2500 feet (*Haviland*, 1359).

Distribution (of species): Malaya, on the mainland to Martaban and South Cambodja, Andamans to the Philippines.

The differential characters as indicated by Radlkofer do not hold good when tried on a larger material. Hairy pits occur also on the leaves of the type specimen, the inflores-

cence is occasionally lax in the Indian plant, and calyx and corolla vary within the extremes which are said to be characteristic of the two species. But there is a differentiation in *Parameria glandulifera* (sensu ampliore): the Philippine and the Kinabalu plants are very minutely hairy in the young branches and inflorescences, just as in Radlkofer's description, and they have smaller calyces than Wallich's specimens. Yet a Bornean specimen, collected by Motley near Banjermassin, shows the same tomentum, though in a less degree, whilst it is otherwise indistinguishable from the typical form; on the other hand, a Javan specimen with glabrous panicles and branches has calyces hardly larger than those of Radlkofer's *P. philippinensis*. Thus I think it more expedient to enumerate the eastern form as a geographical variety of *P. glandulifera*.

ASCLEPIADACEÆ.

Hoya coronaria, Blume, Bijdr. 1063.

Near Koung and Kiau (*Burbidge*).

Distribution: Malay Peninsula; Sumatra; Borneo, Banjermassin (*Motley*, 871).

LOGANACEÆ.

Buddleia asiatica, Lour., Fl. Cochinch. p. 72.

Kadamaian River, alt. 2500 feet (*Haviland*, 1352).

Distribution: Throughout India, Indo-China and Malaya, as far as Timor and the Philippines.

GENTIANACEÆ.

Gentiana lycopodioides, Stapf, n. sp. (§ *Chondrophyllum.*) Perennis (?). Caules graciles, abbreviati et parce ramificati vel elongati et subsimplices, e basi prostratâ ascendentes, nigricantes, ad 4 poll. longi. Folia internodiis duplo et ultra longiora ideoque densa et interdum densissime imbricata vel internodia æquantia et magis dissita, sessilia, ovata, acutissima, sæpe aristulata, crassiuscula, *squarrosa, subplicata, apice recurva*, marginibus anguste chartaceis, dorso plus minusve carinata, 1–1¼ *lin. longa*. Flores solitarii, in ramorum apicibus. Calyx *campanulatus*, 2–2½ lin. longus, lobis tubo æquilongis, e basi ovatâ triangulari-lanceolatis acutissimis. Corolla *campanulata, ad 4 lin. longa*, albida, extus vittis latis olivaceis ornata, *lobis brevissimis* apiculatis, plicis apice latis, rotundatis, minute crenulatis. Filamenta infra medium dilatata. Ovarium *late oblongum*, 1½–1¾ lin. longum, *breviter lateque stipitatum*, angustissime marginatum, stigmatibus subsessilibus. Capsula (submatura) *ellipsoidea, inclusa*, 2½ lin. longa.

In boggy, sheltered, but sunny places, at 11,000 feet (*Haviland*, 1060).

G. lycopodioides belongs, like *G. borneensis*, Hook. fil., to the multifarious group of *G. quadrifaria*, Bl., which is still very little understood. It is chiefly characterized by the comparatively large and bell-shaped flowers and the peculiar habit. The leaves —even those at the base of the stems—are very small and rigid. The stalk of the capsule

is very short. It approaches most to *Gentiana Ettingshausenii*, F. v. Muell., from the Owen Stanley Range in New Guinea.

GENTIANA BORNEENSIS, Hook. fil. in Hook. Ic. Pl. t. 1440 B.

Temburungo, alt. 7500 feet (*Haviland*, 1160; *Low*).

From the more complete material now in my hands, this species is doubtless specifically distinct from *G. quadrifaria*, Blume, though allied to it.

SOLANACEÆ.

SOLANUM BIFLORUM, Lour., Fl. Cochinch. 129, not of Don.

On Kinitaki River, alt. 4000 feet (*Low*); alt. 5000 feet (*Haviland*, 1234).

Distribution: Throughout Tropical Asia.

It seems to me very probable that *S. subtruncatum*, Wall., *S. bigeminatum*, Nees, *S. læve*, Dunal, *S. denticulatum*, Blume, *S. macrodon*, Wall., *S. crassipetalum*, Wall., and probably also *S. bimense*, Miq., and *S. nematosepalum*, Miq., are only forms of one very variable species which was first described by Loureiro, under the name of *S. biflorum*. The supposed differential characters which are derived from the shape of the leaves, the indumentum, the presence or absence and the length of the calyx-teeth are in reality very inconstant, and they hardly allow the distinction of geographical subspecies or varieties. The Kinabalu plant is very similar to the form described as *S. læve* by Dunal, but the linear calyx-teeth rise from below the calyx-limb. They agree also in all characters with *S. Blumei*, Nees, but for the presence of calyx-teeth. From typical *S. denticulatum* they differ chiefly in the glabrous leaves, and from *S. biflorum*, Lour., as it is usually represented by the Chinese specimens, in the glabrous or almost glabrous calyx and shorter, less acute teeth. Some of the Khasia specimens, named *S. crassipetalum*, Wall., and *S. macrodon*, Wall., agree almost exactly, or they differ solely in the length of the teeth or the presence of a more copious tomentum.

BORAGINACEÆ.

HAVILANDIA, Stapf, n. gen.

Calyx profunde 5-fidus, segmentis oblongo-linearibus, post anthesin accrescentibus, tenuiter membranaceis, venulosis. Corolla hypocrateriformis, tubo brevi, cylindraceo, recto, fauce gibbis 5 papillosis instructa; lobi 5, *imbricati*, obtusi, patentes. Stamina 5, tubo affixa, inclusa, filamentis brevissimis; antheræ ovato-oblongæ, obtusæ. Ovarii lobi 4, distincti, gynobasi planæ impositi; stylus filiformis, brevis, *stigmate depresso-capitato*. Nuculæ 4 vel abortu pauciores, erectæ, oblique ovoideæ, *subtriquetræ, ventro acute carinatæ, angulis lateralibus obtusis, basi sæpe breviter stipitatæ*, lævissimæ, atræ, pericarpio tenuiter crustaceo, cum areolâ basilari minutâ gynobasi affixæ. Semina oblique ovoidea; cotyledones planæ. Herba multicaulis prostrata vel repens, strigillosa. Folia alterna. Flores albi, ad axillas solitarii.

HAVILANDIA BORNEENSIS, Stapf, n. sp. (Pl. XVI. A. 1–9.) Caules longe prostrati vel repentes, interdum radicantes, parte inferiore ob folia emarcida longiuscule

denudati, superne parce divaricatim ramosi, distiche foliati, adpresse cinereo-strigillosi. Folia sessilia, semiamplexicaulia, ob basin cauli arcte adpressam breviter semivaginantia, spathulato-cuneata, leviter emarginata, 7–10 lin. longa, 2–3 lin. lata, in margine superne adpresse, basin versus patule ciliata, supra sub apice adpresse strigillosa, subtus, costâ exceptâ, glabra, uninervia. Flores pedicello 1–2 lin. longo, gracili, adpresse strigilloso suffulti. Calycis tubus brevis, demum 1 lin. longus; lobi demum 2 lin. longi, setuloso-ciliati, circa nuculas maturas plus minusve patentes. Corollæ tubus $\frac{4}{5}$ lin. longus; lobi tubo æquilongi, rotundati, basi constricti. Antheræ $\frac{1}{4}$ lin. longæ. Stylus $\frac{1}{2}$ lin. longus. Nuculæ vix 1 lin. longæ.

At 11,500 feet (*Haviland*, 1059); at 11,000 feet, in a small marsh (*Low*).

Havilandia comes nearest to *Myosotis*, particularly to those extreme forms which were described as *M. antarctica* by Sir Joseph Hooker, and *M. spathulata*, Forst. *M. spathulata* is found in New Zealand, *M. antarctica* in New Zealand, Campbell Island, and in Magellan Strait. In both species the flowers are solitary in the axils of normal leaves, but sometimes the upper leaves are more or less reduced, thus forming an approach to the leafless inflorescence of most species of *Myosotis*. In *Havilandia* the upper leaves do not, as a rule, bear flowers; but they do so occasionally, and, so far, there would hardly be sufficient reason to separate the Bornean plant generically from *Myosotis*. The two New-Zealand species above mentioned, however, have exactly the same nutlets as the typical *Myosotis* of the Northern Hemisphere. This is not so in *Havilandia*. Here they are triquetrous, with an acutely carinate ventral edge, and very blunt lateral edges. This is the main character on which the new genus is founded. The prefloration of the corolla of *Myosotis* is stated to be always contorted. If this were really the case, another differential character might be found in the fact that it is distinctly imbricate in *Havilandia*. But I would not lay too much stress upon that. First, the way in which the lobes overlap each other is not constant in *Havilandia*, and then *M. spathulata* and *M. antarctica* at least are exceptions from the type of æstivation in *Myosotis*. The usual form in *Havilandia* seems to be exactly the same which is figured by Eichler in the diagram for *Echium vulgare* ('Blüthendiagramme,' 197). But I find also that sometimes the lobes which correspond to the lateral lobes of the lower lip of *Echium* are overlapped on *both* sides, in consequence of which the lobe between the calyx-segments 2 and 4 is free on both sides. The flowers of *Echium* are slightly zygomorph. A very slight irregularity may be found sometimes also in *Havilandia*, but normally the corolla is regular. In *M. spathulata* I found in the few buds I examined the same æstivation as in *Echium*, whilst in *M. antarctica* the other form, described above for *Havilandia*, seems to be more common.

The new genus approaches, on the other hand, *Trigonotis*, which also has imbricate prefloration, but very characteristic nutlets of a different shape.

SCROPHULARINEÆ.

Euphrasia borneensis, Stapf, n. sp. (Pl. XVI. b. 10–16.) Herba perennis, a basi interdum lignescente multiramosa, 3–10 poll. alta, glabra, vel superne minutissime

puberula, exsiccando nigricans. Folia obovato- vel oblongo- vel ovato-cuneata, circa 2 lin. longa, in petiolum brevissimum attenuata, subobtusa, utrinque obtuse 2–4-crenata, margine revoluto. Flores *solitarii in axillis foliorum secundum totam fere longitudinem ramulorum* hornotinorum; pedicelli graciles, vix 2 lin. longi. Calyx 2–2¼ lin. longus, ad medium 4-fidus; lobi lineares, obtusissimi, in marginibus et præcipue apice incrassati. Corolla alba, flavo-maculata; tubus vix exsertus; labium inferum 2½–3½ lin. longum, laciniis cuneatis truncatis retusis, lateralibus intermedio paulo brevioribus; labium superum subgaleatum, subæquilongum, ad ⅓ bilobum, lobis obtusissimis rubro-striatis. Antheræ cohærentes, subglabræ, basi bilobæ, lobis margine pilosulis, mucronatis. Stylus pilosulus. Capsula *calyce paulo brevior, obovoidea*, obtusissima, apice pilosula vel glabra.

From 8000 to 12,000 feet (*Haviland*, 1061).

Nearly allied to *Euphrasia collina*, R. Br., from Australia, but distinct chiefly by the solitary axillary flowers and the short obovate capsule. The New-Zealand species are also allied.

Brookea albicans, Stapf, n. sp. Rami novelli *dense brevissimeque lanato-tomentosi*, demum glabrati, teretes. Folia petiolo 1–2 poll. longo suffulta, ovata, 3–8 poll. longa, 1½–3½ poll. lata, basi acuminata, in petiolum decurrentia, acuminata, serrulata, supra primo farinosa, mox glabrata, nigricantia, subtus *incano-tomentosa*, nervis lateralibus utrinque 10–13, cum venis laxe reticulantibus supra impressis, infra prominentibus. Racemi axillares et terminales, proventu ad 4 poll. longi, canotomentosi, rhachi crassiusculâ; bracteæ lanceolatæ, 3–4 lin. longæ; pedicelli 2 lin. longi. Calyx sub anthesi tubulosus, vix 6 lin. longus, brevissime et densissime incano-tomentosus, ore obliquo, dentibus 4–5 breviter ovatis; fructifer paulo longior, valde ampliatus, subglobosus, deorsum rumpens. Corolla alba, in fauce flavida; tubus cylindricus, 6–7 *lin. longus*, leviter incurvus, extus tomentosus; limbi lobi rotundati, denticulati, 2½–3 *lin. dimetientes*. Capsula *globosa*, 3 lin. dimetiens, stylo coronata.

In young jungle at the Penokok, alt. 2500 feet (*Haviland*, 1344).

B. incana differs from *B. dasyantha*, Benth., and *B. tomentosa*, Benth., by the very short whitish tomentum and by the smaller flowers and globose capsules.

LENTIBULARINEÆ.

Utricularia orbiculata, Wall. Cat. n. 1500; A. DC. Prodr. viii. 18.

Maripari Spur, alt. 5500 feet; Temburungo, alt. 7500 feet (*Haviland*, 1327, 1328)

Distribution: Tropical Asia.

The specimens under no. 1328 correspond with Wallich's type; those of no. 1327 have larger flowers, with a much longer spur. But, different as they may appear at first sight, they both come within the range of variation which is exhibited, for instance, by the very instructive set of specimens collected by Hooker and Thomson in the Khasia Hills.

GESNERACEÆ.

ÆSCHYNANTHUS MAGNIFICA, Stapf, n. sp. Suffrutex *glaberrimus*. Rami internodiis elongatis 3-pollicaribus, crassiusculi. Folia petiolo 4–6 lin. longo suffulta, elliptico-oblonga, 4 poll. longa, 1½ poll. lata, basi subrotundata, acuminata, coriacea, nervis lateralibus utrinque 6 valde indistinctis. Pedunculi axillares, brevissimi, minute bracteati, uniflori. Pedicellus 3–5 lin. longus. Calyx *obconico-tubulosus*, 1¼ poll. longus, apice 3 lin. latus, 5-dentatus, *dentibus 3 lin. longis*, obovato-oblongis, obtusiusculis. Corolla coccinea, longe exserta, 2½–3 poll. longa, *tubus ventricosus et supra medium leviter curvatus*; lobi rotundati, superiores vix 4 lin., inferiores 6 lin. longi, glanduloso-ciliati. Antheræ 2 lin. longæ.

At 6000 feet (*Haviland*, 1255).

Allied to *Æ. Lamponga*, Miq., and to *Æ. pulchra*, G. Don, but very distinct by the glabrousness of all parts except the margins of the corolla-lobes, the larger size of the leaves and flowers, the long obconical calyx, the longer calyx-teeth, and the shape of the corolla.

ÆSCHYNANTHUS TRICOLOR, Hook. fil. Bot. Mag. t. 5031.

On rocks over streams, alt. 3000 feet (*Burbidge*).

Distribution: According to a note in Mr. Burbidge's diary, it is common everywhere near rivers in North Borneo, either epiphytic on trees or trailing over rocks.

DICHROTRICHUM ASPERIFOLIUM, Benth. et Hook. fil., Gen. Plant. ii. 1014; C. B. Clarke in DC. Monogr. v. pars i. 53.

8000–10,500 feet (*Low*; *Haviland*, 1076).

Distribution: Malaya, from Java to Amboina.

DICHROTRICHUM BRACTEATUM, Stapf, n. sp. Caulis repens, crassiusculus, radicans, exsiccatus irregulariter sulcatus, apicem versus dense fulvo-tomentosus, infra plus minusve glabratus, cortice pallido papyraceo demum soluto. Folia valde inæqualia, altera linearia, 3 lin. longa, tomentosa, mox decidua—ideoque caulis specie alternifolius—altera petiolo dense brevissimeque tomentoso, 3–3½ poll. longo suffulta, e basi leviter cordata, late ovata, acuta, 3–3½ *poll. longa*, 2½ *poll. lata*, indistincte denticulata, crassa, *utrinque fulvo-papilloso-tomentosa*, nervis lateralibus utrinque circa 7. Cymæ dichotomæ, congestæ, in axillis sessiles vel subsessiles, multifloræ; *bracteæ infimæ oblongæ vel oblongo-lanceolatæ*, 1–1¼ *poll. longæ, cum sequentibus (interioribus) cito decrescentibus flores involucrantes*, omnes fulvo-tomentosæ; pedicelli 3–4 lin. longi, tomentosi. Calyx fere ad basin 5-partitus; segmenta 4 lin. longa, lineari-oblonga, tomentella. Corolla coccinea (?), 8–9 lin. longa, extus papillosa, villosula; tubus vix exsertus, superne leviter curvatus, latus; lobus infimus deflexus, 3 lin. longus, cæteri porrecti, summi 1¾ lin. longi, omnes obtusissimi. Stamina longe exserta; antheræ ¾ lin. longæ.

Maripari, alt. 5000 feet (*Haviland*, 1289).

Allied to *D. asperifolium*, Benth. et Hook. fil., but very distinct by the softer indumentum, larger leaves, and the large tomentose bracts.

DIDYMOCARPUS AREOLATUS, Stapf, n. sp. Caulis robustus, dense breviterque ferrugineo-tomentosus. Folia opposita, æqualia, petiolo $1\frac{1}{2}$ poll. longo breviter tomentoso suffulta, oblongo-elliptica, 8 poll. longa, 3 poll. lata, basi in petiolum breviter decurrentia, apice acuta, argute denticulata, supra nigricantia, in costâ nervisque adpresse ferrugineo-hirtella, cæterum demum glabrata, *tuberculis areolis polygonis graciliter circumscriptis crebre obsita*, subtus breviter ferrugineo-tomentella, nervis lateralibus utrinque 16–17, graciliter, hinc inde quidem distincte reticulata. Cymæ in axillis sessiles ad fasciculos redactæ, dense ferrugineo-tomentosæ; bracteæ lineares vel filiformes, 1 lin. longæ; pedicelli 3–4 lin. longi. Calyx *ad basin 5-partitus*; *segmenta fere filiformia, sæpe flexuosa, 4–5 lin. longa*, tomentosa. Corolla alba; tubus basi angustus, deinde valde ampliatus, 10–12 lin. longus, extus fere glaber; labium superum 4 lin., inferum 6 lin. longum, hocce flavo-maculatum, lobis late rotundatis. Stamina fertilia filamentis applanatis geniculatis, antheris 1 lin. longis, dorso glanduloso-pilosulis; sterilia lateralia circa 4 lin. longa, intermedium duplo brevius. Ovarium basi disco majusculo circumdatum, anguste lineare, in stylum minute glandulose pilosulum abiens, cum eo 8–10 lin. longum; stigma bilobum.

From 5000 to 7000 feet (*Haviland*, 1248).

The leaves are very remarkable for their regular and graceful reticulation, which is finely impressed above, enclosing numerous hexagonal or pentagonal areoles with a tubercle in the centre. Underneath it is often inconspicuous on account of the tomentose covering, but it is generally very distinct in transparent light. The tubercle is the widened base of a hair, the upper and thinner part of which shrinks very soon and comes off. The corolla is in size and shape not unlike that of *Chirita acuminata*, R. Br., in which direction probably the affinity of the Kinabalu plant lies, though the calyx is divided to the very base and the segments are very narrow.

CYRTANDRA CLARKEI, Stapf, n. sp. (Pl. XVI. c. figs. 17–19.) Caulis e basi repente radicante ascendens, densissime fulvo-sericeo-velutinus, inferne plus minusve glabratus, internodiis $1\frac{1}{2}$ poll. longis. Folia opposita, æqualia, petiolo 6–8 lin. longo velutino suffulta, lanceolato-oblonga, $1\frac{3}{4}$–$2\frac{1}{4}$ poll. longa, 8–11 lin. lata, utrinque acuta, basi in petiolum plus minusve decurrentia, crenato-denticulata, crassa, supra primo densissime flavido-sericeo-villosa, demum glabrata, nigricantia, subtus in nervis indumento simili sed adpressissimo vestita, cæterum pilis adpressis sericeis, demum plus minusve evanidis obsita, nervis lateralibus utrinque 6–7. Flores solitarii, axillares; pedicelli ad 6 lin. longi, sericeo-villosi; *bracteæ binæ, oblongæ, ad vel ultra medium connatæ*, 7–11 *lin. longæ, indumento foliorum consimili vestitæ, calycis basin includentes*. Calyx obconicus, pollicaris, postice plus minusve fissus, regulariter vel irregulariter 5-dentatus, dentibus brevibus triangularibus vel elongatis apice recurvis, sericeus. Corollæ tubus superne oblique ampliatus, 1 poll. longus, extus sericeus, intus albo-maculatus; lobi coccinei, patentes; labium superum 7 lin. longum, inferum 5 lin. longum, lobo intermedio basi cordato, rotundato, lateralibus oblique ovatis. Stamina 2; filamenta glabra; antheræ ovatæ, 1 lin. longæ, apiculatæ. Ovarium glabrum; stylus minute pilosulus; stigma dilatatum, medio sulcatum.

In damp, shady, and steep places, alt. 10,500 feet (*Haviland*, 1131).

Allied to *Cyrtandra rhynchanthera*, C. B. Clarke, and to *C. fenestrata*, C. B. Clarke, both from Sumatra. It is a species very well marked by the large bracts, which enclose the flower like another calyx.

CYRTANDRA BURBIDGEI, C. B. Clarke in DC. Monogr. v. pars i. p. 262.

At Kiau, *Burbidge*; at 5000 feet (*Haviland*, 1223).

Dr. Haviland states that the bracts are white. In his specimen, which is more fully developed, the petioles are 5 inches long, and the lamina almost 1 foot by $4\frac{1}{2}$ inches.

CYRTANDRA TRISEPALA, C. B. Clarke in DC. Monogr. v. pars i. p. 253.

Penokok River, alt. 3000 feet; alt. 6000 feet (*Haviland*, 1245, 1292).

Distribution: North Borneo.

The leaves are very variable in size and shape, almost equal or very asymmetric at the base, and the smaller ones have their tips spreading or reflexed in most of Dr. Haviland's specimens.

ACANTHACEÆ.

THUNBERGIA FRAGRANS, Roxburgh, Cor. Pl. i. 67.

Kadamaian, alt. 2500 feet (*Haviland*, 1360).

Distribution: Tropical Asia and Australia.

STROBILANTHES KINABALUENSIS, Stapf, n. sp. Caulis herbaceus, tetragonus, fulvo-pubescens vel tomentellus. Folia opposita, inæqualia, majora petiolo $\frac{3}{4}$–1 poll. longo fulvo-tomentello suffulta, ovata, 3–$4\frac{1}{2}$ poll. longa, $1\frac{3}{4}$–$2\frac{1}{4}$ poll. lata, basi acuta, inæqualia, apice acuminata, inæqualiter crenato-dentata vel repanda, supra fuscescentia, adpresse sparsim hirtella, *subtus tenuiter fulvo-tomentella*, nervis lateralibus utrinque 6–8, distincte transverse venulosa; minora $1\frac{1}{2}$–$1\frac{3}{4}$ poll. longa, petiolo breviore, cæterum consimilia. Inflorescentiæ capitatæ, ovatæ, paucifloræ, *multibracteatæ, fulvo-tomentellæ*, longe vel breviter pedunculatæ vel sessiles, in dichasiis perfectis vel redactis, vel gemmis accessoriis auctis dispositæ; dichasia solitaria vel 2–3 fasciculata, sæpe longe pedunculata (ad $2\frac{1}{2}$ poll.), ex axillis superioribus vel pseudo-terminalia, interdum in paniculas foliatas collecta. Bracteæ capitulorum *exteriores ovato-lanceolatæ*, obtusæ, *ad 8 lin. longæ*, interiores cito decrescentes, diu persistentes. Calycis segmenta lanceolata, 4–5 lin. longa, pubescentia, ciliata. Corolla 10–12 lin. longa; tubus inferne tenuis, constrictus, superne subabrupte campanulatim ampliatus, subobliquus, extus sparsim pilosulus; lobi breves, subæquales, late ovati. Filamenta basi pilosula; antheræ 1 lin. longæ. Stylus glaber; stigma arcuatum, unilaterale. Capsula $\frac{1}{2}$ poll. longa; semina 4, elliptico-orbicularia, applanata, undique pilis tenuissimis, undulatis, inelasticis densissime vestita, 1 lin. longa.

Kadamaian River, alt. 2000 feet (*Haviland*, 1362).

Allied to *S. paniculata*, Miq., from Java, but distinct by much larger bracts and a richer indumentum.

Strobilanthes Galeopsis, Stapf, n. sp .Caulis herbaceus, superne subtetragonus, inferne teres, tenuiter fulvo-tomentellus vel demum plus minusve glabratus. Folia opposita, æqualia, *petiolo* tenuissime tomentello et præterea patule setoso, 1–1½ *poll. longo*, suffulta, *ovata*, 2½–3½ *poll. longa*, 1¼–2 *poll. lata*, basi rotundata vel brevissime contracta et in petiolum decurrentia, caudato-acuminata, dentato-crenata, ciliata, supra fuscescentia, adpresse setulosa et præterea minute adpresseque hirtella, subtus hirtella et in nervis setulosa, nervis lateralibus utrinque 7–8, venis transversis satis conspicuis. Spica terminalis, sessilis, ½–1 poll. longa; bracteæ lanceolato-oblongæ, apice sæpe patulæ, utrinque setosæ, diu persistentes; bracteolæ lineares, calyce paulo breviores. Calycis segmenta subæqualia, lanceolato-linearia, hirsuta et setulosa. Corolla *subpollicaris*; tubus ad medium angustus, deinde sensim ampliatus et leviter curvatus, extus parce pilosulus; lobi breves rotundati. Filamenta longiora, pilosula; antheræ 1¼ lin. longæ. Stylus pilosulus. Capsula 4–5 lin. longa; semina 4, ovato-orbicularia, fere 1½ lin. longa, fusca, pilis rufis, adpressis, strictis, vix elasticis vestita.

From 5000 to 7000 feet (*Haviland*, 1159).

Allied to *S. aspera*, Decaisne, from Timor, but distinct by the long-petioled, broadly ovate leaves, and longer corollas. The general habit is very much that of broad-leaved forms of *Galeopsis Tetrahit* or *G. versicolor*.

VERBENACEÆ.

Geunsia farinosa, Blume, Bijdr. 819.

In young jungle at the Penokok, alt. 2800 feet (*Haviland*, 1343).

Distribution: Throughout Malaya, from Singapore and Sumatra to the Philippines and the Moluccas.

Premna cauliflora, Stapf, n. sp. Arbor humilis, inflorescentiis exceptis glaberrima, undique glandulose punctata. Rami tetragoni, pallidi, inter folia linea transversali notati. Folia simplicia, petiolo ½ poll. longo suffulta, late obverse lanceolata, acuminata, callose crenato-denticulata, firma, pallida, nervis lateralibus utrinque 10–12 prominulis, distincte transverse venosa, subtus tenuiter reticulata. Cymæ in *ramis annotinis vel vetustioribus sessiles, e nodis crassiusculis multifloræ vel paucifloræ*, ½–¾ *poll. longæ*, pube minutâ stellatâ dense adpresseque vestitæ; pedicelli demum ad 6 lin. longi, graciles. Calyx cupulari-campanulatus, 1–1¼ lin. longus, subtruncatus, denticulis callosis 4, basin versus parce stellato-puberulus. Corolla alba (ex alabastro tantum nota); tubus calycem fere duplo superans; lobi 4, extus glanduloso-leprosi, late ovati, uno extimo, intimo opposito cæteris paulo minore. Stamina 4, in alabastro subæqualia; filamenta glabra; antheræ lineares, basi bilobæ. Ovarium glandulis aureis depressis dense vestitum; stylus antheras paulo superans, stigma breviter bilobum; loculum unum; placentæ binæ, bifidæ, parietales, deinde subcontiguæ; ovula 4, lateraliter affixa. Drupa ovoideo-globosa, interdum obtuse tetragona, 2 lin. longa, 4-pyrena, cavitate centrali majuscula.

At the Penokok, from 3000 to 3200 feet (*Haviland*, 1301, 1305).

A very well-marked species, the affinity of which I am not able to point out. The floral structure is exactly that of a typical 4-merous *Premna*, but the corolla is perfectly glabrous inside. The inflorescence is said to be terminal in *Premna*, but the fact is that it often terminates short branches which come from the axils of leaves and which bear only a few leaves or none at all. In this case the inflorescence might be called just as well axillary. When these axillary leafless or almost leafless inflorescences appear, the supporting leaves are either still persistent or they have already fallen off. Both cases may be seen on the same specimen. This kind of development has reached its extreme in *P. cauliflora*. The flower-bearing branches are leafless and reduced to a swelling or a knot on the stem, from which the sessile cyme springs.

Clerodendron kinabaluense, Stapf, n. sp. Rami novelli dense patule hirtelli, demum glabrescentes, cortice pallido. Folia opposita, æqualia, petiolo tenuiter puberulo, interdum supra basin et sub apice constricto, 1–1½ poll. longo suffulta, obverse lanceolata vel lanceolato-oblonga, 6–10 *poll. longa*, 2–2½ poll. lata, acuminata, repando serrulata, supra primo setulis minutis, mox—basi incrassatâ exceptâ—deciduis conspersa, subtus in nervis fusco-pubera, nervis lateralibus utrinque 11–13. Panicula terminalis ad 8 poll. longa, 4–5 poll. lata, erecta, patule pubescens: rami bracteis lanceolatis usque filiformibus sustenti, cymas 5–2-floras laxas gerentes; pedicelli 4–7 lin. longi. Calyx 5-partitus; segmenta lanceolata *sub anthesi* 4–5 *lin. longa*, longe acuta, pubescentia, demum excrescentia. Corollæ *tubus tenuis*, 6–8 *lin. longus*, pilosulus; lobi subæquilongi, subspathulati, apiculati. Stamina stylusque ¾ poll. exserta.

At the Penokok, alt. 3200 feet (*Haviland*, 1307).

Allied to *C. disparifolium*, Blume, *C. Griffithianum*, C. B. Clarke, and *C. calamitosum*, but distinct by the long leaves; from the first also by the much larger calyx, and from the second by the shorter corolla-tube. *C. obtusidens*, Miq., of which I do not know the type, has the calyx only half as long, according to the description. There are in the Herbarium several closely-allied species from North Borneo, but all undescribed.

LABIATÆ.

Phlomis rugosa, Benth. in Wall. Pl. As. Rar. i. 63.

From 3000 to 5000 feet (*Haviland*, 1228).

Distribution: From Sikkim and the Khasia Hills to the Mishmi Hills and North Burma; Malaya, from the Peninsula to the Philippines.

POLYGONACEÆ.

Polygonum chinense, Linné, Sp. Pl. i. 520; Meissn. in DC. Prodr. xiv. i. 130

In young jungle on the Tampassuk River, alt. 2500 feet (*Haviland*, 1350).

Distribution: Tropical Asia; China; Japan.

NEPENTHACEÆ.

NEPENTHES LOWII, Hook. fil. in Trans. Linn. Soc. xxii. 420, t. 71.

From 6000 to 8000 feet (*Low*); epiphytic on Dacrydium, Rhododendron, and other scrubby, moss-draped trees, down to 5000 feet (*Burbidge*).

NEPENTHES VILLOSA, Hooker fil. in Hook. Ic. Pl. t. 888.

From 7000 to 9000 feet (*Low*); with *N. Rajah* in yellow loam and rough sandstone grit (*Burbidge*).

NEPENTHES EDWARDSIANA, Low, ex Hook. fil. in Trans. Linn. Soc. xxii. 420.

From 8000 to 9000 feet (*Low*); epiphytic on low mossy shrubs and trees at 6000 feet (*Burbidge*).

NEPENTHES RAJAH, Hook. fil. in Trans. Linn. Soc. xxii. 421, t. 72.

At 5000 feet (*Low*); on open patches among sedges and other herbaceous plants, in yellow loam or in gritty soil, from 5000 to 9000 feet (*Burbidge*).

NEPENTHES PHYLLAMPHORA, Willd. Spec. Pl. iv. pt. ii. 874.—Syn. *N. Burbidgei*, Hooker fil. ex Burbidge in Gard. Chron. xvii. (1882), 56.

At 3500 feet (*Low, Burbidge*).

Distribution: Malaya, from Mt. Ophir and Sumatra to the Louisiades and to South China.

NEPENTHES TENTACULATA, Hooker fil. in DC. Prodr. xvii. 101.

From 6000 to 8000 feet (*Burbidge*); ? at 9000 feet (*Low*).

Distribution: North Borneo.

PIPERACEÆ.

PEPEROMIA CANDIDA, Miq. Syst. Pip. 105.

At 6000 feet (*Haviland*, 1220).

Distribution: Malaya, from Sumatra to Borneo.

CHLORANTHACEÆ.

CHLORANTHUS BRACHYSTACHYUS, Blume, Fl. Jav. viii. 13, 14, t. 2.

At 6000 feet? (*Haviland*, 1205?).

I have some doubt about this label belonging to this plant, as Haviland has written on it:—"*Small tree—flowers white.*"

MONIMIACEÆ.

SCYPHOSTEGIA, Stapf, gen. nov.

Flores unisexuales. Flos ♂ ignotus. Flos ♀: Perianthium fere ad basin 6-lobum; lobi 2-seriatim imbricati, persistentes. Discus receptaculum urceolatum, carnosum, ad faucem incrassatum et recurvum formans. Carpella ∞ in fundo receptaculi, basi squamis hyalinis plerumque 3, inferne varie coalitis, circumdata; stigma obliquum, depressum; ovulum erectum, anatropum. Receptaculum *fructiferum*

auctum, globosum, a fauce rumpens. Carpella stipitata, cylindrica, leviter curvata, erecta, sicca; pericarpium chartaceum. Semen erectum, testâ tenuissimâ, albumine carnoso; embryo axilis medio semine longior, cotyledonibus obovato-oblongis, radiculæ inferæ æquilongis. Frutex scandens. Folia alternantia, chartaceo-membranacea, crenulata. Flores bracteati, in racemis longis, laxis dispositi; racemi inferne compositi, ramis flores 2 valde approximatos gerentibus, quorum alter plerumque abortivus; bracteæ infundibuliformes, truncatæ.

SCYPHOSTEGIA BORNEENSIS, n. sp. (Pl. XVII. 1–14). Frutex glaberrimus. Ramuli graciles, obscure angulosi. Folia oblonga, ad 5 poll. longa, ad $1\frac{3}{4}$ poll. lata, subabrupte breviterque acuminata, basi rotundata, crenulata, exsiccando fuscescentia, lucida, nervis lateralibus utrinque 6–9, subtus prominulis, venis transversalibus crebris, tenuibus. Racemi ad 1 ped. longi, subflexuosi, ad ramorum basin decidue minuteque bracteati; rhachis angulosa; rami graciles, $1–1\frac{3}{4}$ poll. longi. Bracteæ flores subtendentes infundibuliformes, 2 lin. longæ, truncatæ. Pedicelli breviter vel vix e bracteis exserti. Perianthium in alabastro ovatum apiculatum, sub anthesi patens, segmentis exterioribus quam interiores subduplo majoribus, obovato-oblongis, 2–3 lin. longis. Receptaculum globosum, sub anthesi 2 lin. altum, margine recurvo, incrassato, lobulato coronatum; *fructiferum* 9 lin. dimetiens. Carpella pilosa, ad 4 lin. longa.

Near Koung, alt. 2000 feet (*Haviland*, 1377).

The floral structure of this plant is in many ways so remarkable that I feel justified in founding upon it a new genus, though the male flowers are unknown. There is no genus in Monimiaceæ to which it might be said to be manifestly allied. Yet the analogies with genera of this order are so obvious that I consider it will most appropriately find its place amongst them. There is very little in the vegetative parts and in the inflorescence to guide us as to the systematic position, though the leaves are not unlike those of *Daphnandra repandula*, F. v. M., in texture, venation, and general appearance. The flowers on the lower branches of the inflorescence stand usually in pairs, very close to each other, and supported by a pair of obconical truncate bracts which fit exactly into each other, and more or less enclose the pedicels. It seems that only one of these flowers develops normally, whilst the other remains in the state of a bud. In the upper part of the inflorescence no second flower is formed; yet we may assume *per analogiam* that these solitary flowers are in fact reduced inflorescences. These two-flowered and one-flowered partial inflorescences are then collected into a long and very loose raceme. There is nothing very peculiar in the perianth; the "disc," however, deserves full attention. It is a fleshy, urn-shaped receptacle, the margin of which is very much thickened and recurved, leaving open only a narrow passage. From the bottom of this receptacle the carpels rise, filling scarcely more than one half of the cavity. They seem to be enveloped in a young state by a delicate membrane, which later splits more or less irregularly into 2–3 lobes, reminding one of the perianth of a fig-flower. The lower part and even the lobes themselves are more or less connate, and it is difficult, if not impossible, to separate them without tearing them. The carpels are distinctly stalked.

The stigma is oblique, and there is generally a more or less marked one-sided constriction below it. It is depressed in the middle, and the depression leading to the stigmatic channel is clothed with minute papillæ. The ripe fruit consists of the enlarged receptacle, supported by the persistent perianth. It seems to break up from the mouth, thus exposing or freeing the enclosed carpels. Judging from the ripe seed, the solitary ovule is erect and anatropous.

The arrangement of the apocarpous ovaries in an urn-shaped cavity is very characteristic of various Monimiaceæ; but in these the cavity is formed by the convex torus in connection with the perianth-tube, and the perianth-lobes surround the mouth of this receptacle. In some species, however, the margin round the mouth is distinctly raised into a rim. If we imagine this rim enlarged and transformed into an urn-shaped receptacle and at the same time the torus raised to the level of the insertion of the petals, we should get the same structure as we find in *Scyphostegia*. As to the carpels themselves and the seeds, there is nothing in them which would disagree with the general characters of Monimiaceæ, though the embryo is remarkably large for the order. The involucre at the base of the carpels is, however, very peculiar. The material in my hands is hardly sufficient to clear up their development so thoroughly as I wished, particularly with regard to the earlier stages. Yet I have the impression that this involucre is not formed by true phyllomes, but is rather of the nature of trichomes and emergences. In various Monimiaceæ the tissue of the torus protrudes between the carpels so as to envelop them more or less completely, in others it sends forth hairs between them. The involucre in *Scyphostegia* is therefore possibly an analogous growth.

I have examined the anatomy of the branches and of the leaves, and Dr. Solereder of Munich was so kind as to do the same. But neither of us was able to find anything characteristic in the anatomical structure; the secretion-cells present in the leaves of most Monimiaceæ were not met with in *Scyphostegia*.

LAURACEÆ.

LITSÆA CAULIFLORA, Stapf, n. sp. (§ *Cylicodaphne*) ♂. Rami novelli brevissime fulvo-tomentelli. Folia alterna, petiolo crasso 6–8 lin. longo suffulta, *oblongo-lanceolata*, 7–9 *poll. longa*, 2–3 *poll. lata*, basi breviter attenuata, apice subacuminata, tenuiter coriacea, supra opaca, demum glabrata vel in costâ diutius adpresse fulvo-tomentella, *subtus purpureo-glaucescentia, undique tenuiter pubescentia*, nervis lateralibus utrinque 18–20, subrectis, deinde sub margine subito prorsus arcuatis, venis transversalibus distinctis, tenuiter reticulata, nervis venisque supra impressis, subtus prominulis. Umbellulæ *in racemis densis, valde abbreviatis, in acervis interdum* 1 *poll. dimetientibus, e ramis vetustis ortis conglomeratæ*; pedunculi demum 2–3 lin. longi, ut bracteæ involucrantes fulvo-sericei; flores circiter 6, brevissime pedicellati. Perigonium extus fulvo-sericeum, 6-partitum; segmenta obverse lanceolata, 2 lin. longa. Stamina 12, interiora sensim minora; filamenta extimi cycli $3\frac{1}{2}$ lin., intimi $1\frac{1}{2}$ lin. longa, omnia pilosa, cyclorum interiorum basi biglandularia, antheræ omnes 4-locellatæ. Ovarium rudimentarium.

At 5000 feet (*Haviland*, 1221).

The foliage is not unlike that of *Litsæa khasiana*, Meissn., or *L. elongata*, Wall., with which the affinity probably lies.

LITSÆA ZEYLANICA, C. & Fr. Nees in Amœn. Bot. Bonn. fasc. i. 58, t. 5, ex Nees Syst. Laur. 626.—♂, ♀.

At 8000 feet (*Haviland*, 1128).

Distribution: Throughout Malaya, from Sumatra to the Philippines and the Moluccas; on the mainland to the Khasia Hills and Bhotan; Ceylon and in the Deccan Peninsula as far as the Concan.

I take *L. cinnamomea*, Blume, from Ternate, and a specimen from Luzon (*Vidal*, 528), to be the same species.

LINDERA (?) GRANDIFOLIA, Stapf, n. sp. ♀. Rami crassi, novelli brevissime fulvo-tomentelli. Folia opposita vel subopposita, petiolo crasso 3–4 lin. longo suffulta, obovato-oblonga, 9–13 poll. longa, $3\frac{1}{2}$–5 poll. lata, basi breviter acutata, apice breviter et latiuscule acuminata, tenuiter coriacea, supra costâ nervisque puberulis exceptis glabrata, fuscescentia, subtus purpureo-glaucescentia, sparse et minutissime pilosula, nervis lateralibus utrinque 10–12, angulo 45° ortis, venis transversalibus laxis distinctis, utrinque tenuiter reticulata, nervis supra leviter impressis, venis venulisque utrinque prominulis. Umbellulæ in racemis valde abbreviatis, multifloris, densis vel depauperatis, solitariis vel pluribus dense glomeratis, circiter 4-floræ; pedunculi 1–$1\frac{1}{2}$ lin. longi, ut bracteæ involucrantes fulvo-sericei; pedicelli subnulli. Perigonium extus sericeum; segmenta 6 inæqualia, 3 plerumque multo minora, majora ovata acuta, 1 lin. longa. Staminodia 12 filiformia, interiora breviora et basi glandulis binis instructa. Ovarium glabrum, cum stylo $1\frac{1}{2}$ lin. longum; stigma dilatatum, sublobatum. Bacca (immatura) perigonii tubo truncato, explanato, vix aucto insidens, oblonga, 4 lin. longa.

Penokok River, alt. 3000 feet (*Haviland*, 1334).

This is possibly a *Litsæa*, but the fruit resembles closely that of *Lindera reticulata*.

LINDERA CÆSIA, Reinw. ex Villar in Blanco, Fl. Filipp. ed. III. App. 181.—Syn. *Daphnidium cæsium*, Nees in Miq. Fl. Ind. Bat. i. 976.

——, var. RUFA, Stapf. Ramuli novelli et petioli dense rufo-strigillosi. Folia majora ad $1\frac{1}{2}$ poll. longa, acuminata, sed non adeo ut in var. *acuminata*, Miq. l. c.

At 8000 feet (*Haviland*, 1106).

Distribution (of species): Malaya, from Sumatra to the Philippines.

PROTEACEÆ.

HELICIA ERRATICA, Hook. fil. in Fl. Brit. Ind. v. 189.

At 5000 feet (*Haviland*, 1197).

Distribution: Sikkim Himalaya, Khasia Hills and Martaban, East to Burma; Borneo.

Dr. Haviland states that the flowers are white, whilst those of the Sikkim and Khasia plants are said to be pale yellowish. The material is rather imperfect, and the Bornean plant may prove to be a new species or variety.

THYMELÆACEÆ.

DRAPETES ERICOIDES, Hooker fil. in Hook.. Ic. Pl. 895.

From 12,000 feet to the top (*Low; Haviland*, 1078).

Distribution: North Borneo; New Guinea, Mt. Knutsford.

LORANTHACEÆ.

LORANTHUS ESTIPITATUS, Stapf, n. sp. (§ *Dendrophthoë*).—Frutex epiphyticus. Ramuli novelli ferrugineo-furfuracei, mox glabrati, vetustiores crebre lenticellis albidis conspersi. Folia opposita, petiolo circiter 3 lin. longo suffulta, oblonga vel elliptica vel plus minusve formam obovatam vel ovatam appetentia, $\frac{3}{4}$–2 poll. longa, $\frac{1}{2}$–$1\frac{1}{4}$ poll. lata, basi rotundata vel plus minusve breviter cuneata, apice obtusa, coriacea, juvenilia ferrugineo- vel fulvo-furfuracea, mox glabrata, nervis lateralibus utrinque 3, rarius 4, plerumque valde indistinctis. Cymulæ axillares, pedunculo 1–2 lin. longo (rarius longiore) suffultæ, furfuraceæ vel glabratæ; pedicelli 2–4 lin. longi, sub flore ipso bracteam minutam ovatam vel rotundatam, margine ciliolatam gerentes. Calycis limbus brevissimus, ciliolatus. Corolla *in alabastro* tubo incurvo vel subrecto, gracili, basi haud nisi anthesi imminente ampliato, apice obtuse capitato-clavata, plus minusve furfuracea, *aperta*, 6–10 lin. longa, postice ultra medium fissa; lobi 4, lineari-spathulati, a medio refracti. Stamina lobis corollinis breviora; antheræ lineares, 1 lin. longæ. Ovarium *breviter oblongum vel globosum*, vix 1 lin. longum, primo furfuraceum, demum glabrescens; stylus corollâ paulo longior; stigma capitatum. Bacca *ovoidea vel oblonga vel subglobosa*, ad 3 lin. longa, glabrata.

On the Tampassuk River, alt. 2500 feet (*Haviland*, 1351).

Distribution: From Tonkin and South China to Borneo and the Philippines; Perak.

I refer the following specimens to this species:—Tonkin: Tu-Phat [*Balansa*, 2329], Ououbi [*Balansa*, 1030]; South China: Lo Fau Shan, Prov. of Canton [Hort. Bot. Hongk. a. 1883, 7], Hainan [*Henry*, 8261]; North Borneo: Kudat [*Dr. Fraser*, 183]; Philippines [*Cuming*, 1970]; Perak [*Scortechini*, 311, 421].

The Philippine specimen is enumerated as *L. sphenoideus*, Blume, in Vidal, Pl. Vasc. Filip. 231, together with no. 490 of Cuming; but only the latter can be referred to *L. sphenoideus*. Scortechini's plant, on the other hand, was named *L. Scurrula* var. *obtecta* by Dr. King, Journ. As. Soc. Beng. lvi. p. 92. But, as in Cuming's specimen, no. 1970, the fruit is oblong and not at all clavate. I have carefully gone through our whole material of *L. Scurrula*, which comprises several bundles, and found the shape of the fruit very uniformly clavate; and whilst I should not object to merging *L. repandus*, *obovatus*, and *sphenoideus* (all of Blume) into *L. Scurrula*, I think the species just described is distinct enough to deserve specific rank, the chief differential character being the shape of the ovary and fruit. It is not impossible that it will prove to be identical with *Dendrophthoë fuscata*, Miq. (= *Loranthus fuscatus*, Korth.), from Sumatra. The fruit of this species is said to be a "bacca ovato-globosa," but Miquel

adds "inferne attenuata." I have not seen the type of it, and I do not consider the description to be sufficient for identification. The specimens on which *Loranthus estipitatus* is founded differ to a certain degree in the intensity of the tomentum, the size of the leaves, and the length of the corolla, but not so much as the various forms comprised under *L. Scurrula* do. The fruit is more ovoid in the Bornean specimen, and more oblong, or almost cylindric, in that from Perak; but these extreme forms are perfectly connected by intermediate states, and they are always sessile, not stipitate.

LORANTHUS SABAENSIS, Stapf, n. sp. (§ *Lepeostegeres*). Frutex parasiticus, glaberrimus. Rami crassi, teretes vel irregulariter angulati. Folia opposita vel subopposita, petiolo 4–5 lin. longo crasso suffulta, ovata, 2 *poll. longa*, 1–1¼ *poll. lata*, basi rotundata, rarius subcordata, apice acuta, coriacea, costâ subtus prominente, cæterum enervia, evenia. Capitula strobiliformia, axillaria, ovata vel oblonga, tetragona, corollis omissis ½–¾ poll. longa, 3–4-flora. Bracteæ exteriores involucrantes 8–10, interiores accrescentes, rotundato-ovatæ usque oblongæ, obtusæ vel subacutæ, pergamaceæ, castaneæ, dorso carinatæ, intimæ flores subtendentes, lineares, circa 6 lin. longæ. Calycis limbus vix ½ lin. altus, subscariosus, irregulariter lobulatus. Corolla flavida, in alabastro clavata, aperta, tubo subrecto *vix* 1 *poll. longo, gracili, sub fauce leviter dilatata*; *segmenta* 6, *basi ovata, ad* 2–3 *lin. erecta, deinde linearia et reflexa*, expansa 8–9 lin. longa. Stamina 6; filamenta linearia, porrecta, cum antheris linearibus 2 lin. longa, corollæ segmentis expansis paulo breviora. Ovarium turbinatum, 1 lin. longum; stylus filiformis, 1½–1¾ poll. longus; stigma capitatum.

From 9000 to 11,000 feet on *Rhododendron ericoides* and *Leptospermum recurvum* *Haviland*, 1079, 1108).

Distribution: North Borneo (Sarawak, *Becc.* 2579).

A very incomplete young specimen, collected by Low at 8000 feet on Kinabalu, evidently belongs also to *L. Havilandii.*

Allied to a *Lepeostegeres* from Malacca [*Maingay*, 695], which, according to Dr. King, is perhaps identical with *L. Kingii*, Scort. ex King, in Journ. As. Soc. Bengal, lvi. p. 99. Maingay's specimen differs by its larger leaves and much larger flowers (to 2¼ in.), which are split for about 4–6 lin. into 5 linear segments, then widened for 1–1½ in. and very narrowly cylindric at the base. I have not seen the type of *L. Kingii*, but from the description it appears to me rather doubtful whether Maingay's specimen is really identical with the true *L. Kingii.* However that may be, Haviland's plant certainly differs also from the latter by the smaller leaves and flowers and the sexfid corolla, which is not slit on one side.

LORANTHUS CENTIFLORUS, Stapf, n. sp. (§ *Lepeostegeres*). (Pl. XVIII. c. 9–10.) Frutex parasiticus, glaberrimus. Rami stricti, teretes, nigricantes. Folia subopposita, petiolo crassiusculo 6 lin. longo suffulta, ovato-oblonga, 3–3½ poll. longa, 1¼–1½ poll. lata, basi rotundata, apice obtusa, coriacea, supra fusco-nigricantia, subtus rubro-fusca, nervis lateralibus utrinque 6–8, tenuissimis. Flores *numerosissimi, ad* 50, *in capitulis fere* 2 *poll. dimetientibus subterminalibus congesti, bracteis amplis involcruatis.* Bracteæ chartaceæ, circiter 6, exteriores breviores, rotundatæ, transverse

latiores, interiores longiores, rotundo-obovatæ usque spathulatæ, ad 1 poll. longæ, in margine scariosæ et interdum undulatæ. Receptaculum crassum, ½ poll. dimetiens. Pedicelli nulli vel brevissimi, crassi, angulati, rarius ad 2 lin. longi, apice *bracteolam sæpissime ad lineam elevatam, ovarii basin cingentem vel unilateraliter subtendentem, redactam* gerentes. Calycis limbus ad 1 lin. altus, 5-dentatus. Corollæ *tubus* 2–3 *lin. longus*; *segmenta filiformia*, ad 8–9 lin. porrecta, abhinc refracta, parte refractâ 3 lin. longâ anguste lineari. Stamina 5; *filamenta segmentis adnata*, ad ½ lin. libera; antheræ subulatæ, 2 lin. longæ, plus minusve tortæ. Ovarium angulatum, 1½ lin. longum, mox basi dilatatum et superne constrictum. Bacca (immatura) ampullacea, plus minusve angulata, 3–4 lin. longa.

At 6500 feet (*Haviland*, 1247).

A very fine and remarkable species, the affinity of which is not quite evident at first sight. The inflorescence is not unlike that of the *Lepeostegeres* group, and it comes particularly near to that of *L. Beccarii*, King. But the bracts are much less numerous, and the heads are short and broad, containing about 50 flowers each. They spring from the uppermost axils of young branches, thus appearing almost terminal. The ovaries are, as in *L. Beccarii*, closely packed together and more or less angular from the mutual pressure, and there are no pairs of bracteoles at the base of the pedicels, which are usually reduced to a minimum and grow only partly longer after fertilization has taken place. The corolla is split for ¾ of the entire length, and there is a sudden bend, about ⅕ below the apices of the segments, by which the upper part is perfectly deflexed, so that it appears almost as an appendix to the corolla-segments. The filaments are not free from the base of the segments as in typical *Lepeostegeres*, but only from a little below the bend just mentioned. This is also the case in *L. sabaensis*, where, however, the corolla-tube is much longer. The disappearance of the bracteoles may be explained as suppression caused by the close packing of the numerous flowers, whilst the coalescence of the filaments and the corolla for the greatest part of their length might be considered as having remained unaltered in spite of the far advanced partition of the corolla. Thus the species may be characterized as a *Lepeostegeres* with very numerous and closely packed flowers, with consequently-suppressed bracteoles, and with a very deeply-slit corolla.

BALANOPHORACEÆ.

BALANOPHORA ELONGATA, Blume, Enum. Pl. Jav. i. 87.

At 11,000 feet (*Haviland*, 1166).

Distribution: Java; Borneo.

BALANOPHORA LOWII, Hooker fil. in Trans. Linn. Soc. xxii. 426, t. 75 C.

In shady woods (*Low*).

EUPHORBIACEÆ.

GLOCHIDION TENUISTYLUM, Stapf, n. sp. ♀. Frutex humilis. Ramuli tenues vel validiores, interdum leviter anfracti, dense fulvo- vel rufo-hirtelli. Folia petiolo hirtello 1–1½ lin. longo suffulta, oblonga vel ovato-oblonga, 3½–4 poll. longa, 1¼–1¾ poll. lata, basi rotundata, sæpe paulo inæqualia, breviter acuteque acuminata, firme membra-

nacea, pallida, supra (demum quidem), costâ nervisque hirtellis exceptis, glabra, minute pustulata, subtus in nervis venisque hirtella, cæterum pubescentia, nervis lateralibus utrinque circiter 7 cum venis transversalibus arcuatis vel flexuosis laxe anastomosantibus, supra sæpe impressis, subtus valde prominulis. Flores feminei 3–5 in fasciculis axillaribus dense glomerati. Calyx vix 1 lin. longus, dense hirtellus; segmenta 6, lineari-oblonga. Ovarium densissime hirtellum; styli 4, raro 5, *ad medium in columnam e basi quam ovarium vix tenuiore sensim pauloque incrassatam vel subcylindricam connati, abhinc filiformes*, subdivergentes, minute hirtelli, $1\frac{1}{2}$–$1\frac{3}{4}$ *lin. longi.*

At the Penokok, alt. 4000 feet (*Haviland*, 1303).

Very similar in habit, foliage, and tomentum to *Glochidion Moonii*, Thw., from Ceylon, but distinguished by the slender styles, which are connate to one half of their length only, and decidedly shorter.

DAPHNIPHYLLUM BORNEENSE, Stapf, n. sp. Frutex vel arbor humilis, glaberrimus. Ramuli crassiusculi, circa 2 lin. dimetientes, cortice nigricante, inferne lenticellis, interdum crebris, pallidis obsiti. Folia ad apices innovationum valde approximata, petiolo 6–8 lin. longo suffulta, *elliptica vel obovato-elliptica*, $2\frac{1}{2}$–$3\frac{1}{2}$ poll. longa, 1–$1\frac{3}{4}$ poll. lata, basi breviter acuta, apice abrupte breviterque apiculata, tenuiter coriacea, exsiccando nigricantia, subtus plus minusve glaucescentia, *nervis lateralibus utrinque circiter* 7, angulo circiter 60° ortis, insigniter *laxissime reticulata*, nervis venisque supra impressis vel prominulis, subtus prominentibus. Flores *masculi* subumbellati vel brevissime racemosi, pedunculo $\frac{1}{2}$–1 poll. longo suffulti; pedicelli 2–3 lin. longi. Sepala ovata, vix $\frac{1}{2}$ lin. longa. Stamina 5–9; filamenta $\frac{1}{3}$ lin. longa; antheræ paulo a dorso compressæ, *lineares*, 1 *lin. longæ*, minute apiculatæ. Flores feminei in racemis demum elongatis, pedunculo 4–6 lin. longo suffulti; pedicelli ad 3 lin. longi. Sepala ovata, $\frac{1}{2}$ lin. longa, mox decidua. Ovarium ovatum, 1 lin. longum; stylus crassiusculus, brevis; *stigmata* recurva, *ovario fere æquilonga*. Fructus ellipsoideo-globosus, 4 lin. longus, basi rotundatus, apice stigmatibus coronatus.

From 10,000 to 11,000 feet (*Haviland*, 1070).

I have much hesitation in founding a new species on this plant, as it comes so near to *D. himalayense*, Muell., and particularly *D. glaucescens*, Blume. But, after repeated comparison with the very rich material of these species in the Kew Herbarium, I prefer to keep it separate. It differs from *D. glaucescens* by the longer and narrower anthers, which are at least twice as long as broad, and by the much longer stigmata, and perhaps also by the very coarse and prominent reticulation; from *D. himalayense* by the broad leaves, the less numerous nerves, and the longer stigmata. I find the anthers and the stigmata extremely uniform in *D. glaucescens*, though the species covers a very large area, and this was the reason which chiefly induced me to separate the Bornean plant as a species.

BACCAUREA LANCEOLATA, Muell. Arg. in DC. Prodr. xv. pt. ii. 457.

At the Penokok, alt. 3000 feet (*Haviland*, 1340).

Distribution: Malaya, from Sumatra to Borneo.

ANTIDESMA AURITUM, Tulasne, in Ann. Sc. Nat. 1851, p. 203 ♂ (ex descr.).

At the Penokok, alt. 4000 feet (*Haviland*, 1337).

Distribution: Java.

I have not seen any specimen of this species, but the plants in my hands agree so perfectly with Tulasne's explicit description that I have little doubt in referring them to this species. The leaves vary in Haviland's specimens from 7 to 9 in. in length, and from $1\frac{1}{4}$ to $2\frac{1}{4}$ in. in breadth.

ANTIDESMA MORITZII, Muell. Arg. in Linnæa, xxxiv. 67.

At Koung, 2000 feet (*Haviland*, 1374).

Distribution: Malaya; on the mainland as far as Tenasserim; in the Archipelago from Sumatra to the Philippines.

Beccari, Sarawak, no. 3146, and a specimen by Barber, probably from Labuan, belong also to this species.

CLAOXYLON PAUCIFLORUM, Stapf, n. sp. (§*Eu-Claoxylon*.—♂ ♀). Ramuli pallidi, novelli dense et adpressissime subsericeo-pilosi, mox glabrati. Folia alterna, *petiolo* $\frac{1}{2}$–$\frac{3}{4}$ *lin. longo*, supra canaliculato suffulta, oblongo- vel obovato-lanceolata, 4–7 poll. longa, $1\frac{1}{2}$–$2\frac{1}{2}$ poll. lata, basi acuta, biglandulosa, apice breviter caudato-acuminata, in margine calloso-denticulata, pallide viridia, supra primo adpresse pubescentia, demum glabrata, subtus, præcipue in nervis venisque, minute adpresseque pilosa, nervis lateralibus utrinque 6 erectis, venis transversalibus tenuibus, distinctis, subhorizontalibus. Mas: Spicæ (juveniles) $\frac{1}{2}$–$\frac{3}{4}$ *poll. longæ*, adpresse pilosæ; bracteæ, ut videtur, ad normam *uniflorœ vel biflorœ* (?), late ovatæ, $1\frac{1}{2}$ lin. longæ, suâ longitudine distantes; bracteolæ multo minores. Calyx ante anthesin ovato-globosus, adpresse pilosus, vix 1 lin. longus, 3-partitus, valvaris. Receptaculum in totâ superficie inter stamina glandulis ovatis vel breviter cylindricis, apice pilis 1-3 duplo triplove longioribus instructis obsitum. Stamina numerosissima; antheræ loculis inter se liberis, basi fixæ. Femina: Spicæ *valde redactæ, rhachi circiter* 2 *lin. longâ, bi- vel uniflorœ*; bracteæ late ovatæ, obtusæ, 1–$1\frac{1}{2}$ lin. longæ. Calyx 3-partitus; segmenta ovata, 1–$1\frac{1}{2}$ lin. longa, adpresse pilosula. Ovarium disco crassiusculo irregulariter lobulato cinctum, globosum, 2 lin. dimetiens, 3-loculare, villosum; stigmata simplicia, subsessilia, intus grosse papillosa; ovula in quoque loculo solitaria.

At the Penokok, alt. 3000 feet (♀) (*Haviland*, 1347); at 6000 feet (♂) (*Haviland*, 1344).

In habit and foliage not unlike *C. longifolium*, Muell., but very distinct by the short few-flowered inflorescences, and also by the shorter petioles.

ACALYPHA CATURUS, Blume, Bijdr. 629; Mueller Arg. in DC. Prodr xv. pt. ii. 805.

Penokok, alt. 3000 feet (*Haviland*, 1342).

Distribution: Malaya, from Sumatra to Borneo; probably also in New Guinea.

This seems to be a very variable plant. Haviland's specimen has very large leaves (the largest 7 by $5\frac{1}{2}$ in.) and extremely slender and long spikes (to 14 in.). A specimen obtained by Beccari (Piant. Sum. 754) from the province of Padang belongs to it, and probably also a specimen collected by Forbes (127) in the Sogeri region, Eastern New Guinea.

ACALYPHA STIPULACEA, Klotzsch, in Nov. Act. Ac. Nat. Cur. xix. Suppl. i. 416.
In young jungle on the Tampassuk River, alt. 2500 feet (*Haviland*, 1363).
Distribution: Malaya, from Java to the Philippines and Moluccas.
This plant was also collected by Dr. M. Fraser at Banggi, North Borneo (no. 232).

URTICACEÆ.

FICUS SETIFLORUS, Stapf, n. sp. (§ *Eu-Syce*?) (Pl. XVIII. B. 5–8.) Frutex humilis. Ramuli *graciles*, novelli fulvo-strigillosi, vetustiores cortice pallide brunneo. Folia *petiolo fulvo-strigilloso* $\frac{3}{4}$–$1\frac{1}{2}$ *poll. longo suffulta*, ovata, 3–$4\frac{1}{2}$ poll. longa, $1\frac{3}{4}$–$2\frac{1}{2}$ poll. lata, basi rotundata, apice acuminata, margine argute serrato-dentata, *firmule membranacea*, supra sparse strigulosa, aspera, subtus in nervis venisque hispidula, nervis lateralibus utrinque 4–6, pare infimo fere e basi orto, venis transversalibus tenuibus remotiusculis, reticulatione tenuissimâ. Receptacula feminea axillaria, subsessilia, involucro triphyllo cincta, phyllis minutis late rotundatis, matura, globosa, 3–$3\frac{1}{2}$ *lin. dimetientia*, flavida, adpresse *sparseque hispidula*, intus flavido-setosa. Perianthium pedicellatum, segmenta 3–4, oblonga vel obovata, tenuissima, irregulariter crenulata; *dorso, imprimis apicem versus, setulis rigidis* $\frac{1}{2}$ *lin. longis, segmentis ipsis longioribus, obsita*. Achænium subglobosum; stylus lateralis, $\frac{1}{2}$ lin. vel paulo longior.
At 7600 feet (*Haviland*, 1214).

Evidently allied to *F. chrysocarpa*, Reinw., with which it has the bristly perianth in common, but the branches are much more slender, the petioles much longer, the leaves thinner, and the receptacles smaller and not tomentose. The perianth is comparatively larger. On the other hand, it resembles also certain species of the section *Sycidium* in its general appearance, and it might, perhaps, be better placed in it.

FICUS KINABALUENSIS, Stapf, n. sp. (§ *Eu-Syce*.) Frutex glaberrimus. Ramuli nigrocinerascentes. Folia *sessilia, obovata*, $1\frac{1}{2}$–2 poll. longa, 8–9 lin. lata, basi subcuneata, *apice obtusa vel apiculata*, margine incrassato, angustissime revoluto, coriacea, exsiccando supra nigrescentia, subtus fusca, nervis lateralibus utrinque 8–10 patulis, supra impressis, subtus prominentibus, tenuioribus, paucis sæpe interjectis, subter marginem distincte arcuatim anastomosantibus. Receptacula mascula bina in axillis foliorum, pedunculo 1–2 lin. longo suffulta vel subsessilia, involucro triphyllo basi cincta, phyllis rotundatis 1 lin. longis ciliolatis, globoso-ovata, 3 lin. longa. Flores masculi sub receptaculi ore dispositi. Perianthium glabrum; segmenta 3–4, obovata; stamina 3. Flores gallipari numerosi; perianthii segmenta 3, obovata vel posterius plus minusve navicularia; ovarium subglobosum; stylus brevis lateralis.
At 8000 feet (*Haviland*, 1216).

Allied to *F. variolosa*, Lindl., but differing in the broad, usually very obtuse and sessile leaves.

FICUS MOTLEYANA, Miquel, in Ann. Mus. Lugd. Bat. iii. 228, 294.
At 8800 feet (*Haviland*, 1215).
Distribution: All over Borneo.

LAPORTEA STIMULANS, Miquel, in Zollinger, Cat. 103.

At 5000 feet, 3–4 feet high (*Haviland*, 1222, 1230).

Distribution: Malaya, from the Peninsula to the Philippines.

Dr. Haviland's specimens differ from the type specimens in their leaves being thinner and acute at the base or almost decurrent, but specimens from the Malayan Peninsula, chiefly from Perak, vary so much in these points that I doubt whether these characters can be relied upon. No. 1222 agrees exactly with a plant collected by Motley near Banjermassin (no. 346). Weddell says, in a note on the sheet, "forsan ad *L. crenulatam*, var. β. referenda." But I am inclined to refer this var. β., *i. e. luzonensis*, to *L. stimulans* rather than to *L. crenata*, Gaudich. However that may be, *L. crenulata* and *L. stimulans* are extremely close.

LAPORTEA, sp. aff. *L stimulanti*, Miq. ♂.

Penokok River, alt. 3000 feet (*Haviland*, 1341).

This is probably a new species, very distinct by the sessile or subsessile leaves, which are obovate-lanceolate and long cuneate at the base. The material, however, is too incomplete for description.

PILEA JOHNIANA, Stapf, n. sp. (Pl. XIX. D. 17–26.) Herba perennis, nana, cæspitosa, e basi ramosa; rami prostrati radicantes, tenues. Folia *densa, superne sæpe densissima et internodiis multo longiora*, petiolo ½ lin. longo vel brevissimo latiusculo suffulta, orbicularia vel deltoideo-orbicularia, 1–1½ lin. longa, basi brevissime latissimeque cuneata, apice obtusissima, *carnosa*, exsiccando nigricantia, triplinervia, nervis inconspicuis utrinque, sed præcipue subtus, cystolithis linearibus minutis conspersa. Stipulæ minutæ, lanceolatæ, ¼ lin. longæ. Flores *masculi* in axillis *solitarii*, subsessiles. Perianthium bipartitum vel 4-partitum; segmenta rotundata, cucullata, apiculata; stamina 2 vel 4. Flores *feminei* in cymulis axillaribus folio multo brevioribus, *paucifloris*; pedicelli ½ lin. longi vel breviores. Perianthium tripartitum; segmentum intermedium vix ad ½ lin. longum, ovatum, cucullatum, quam lateralia, plerumque in margine glandulosa, 2–3plo longius. Staminum rudimenta minutissima. Ovarium ovatum; stigma breviter penicillatum, sessile. Achenium suboblique globoso-ovatum, ¼–⅓ *lin. longum*, læve.

In crevices of rocks from 11,000 to 12,000 feet (*Haviland*, 1391).

A very marked species, allied to *P. peploides*, Hook. et Arn. It differs by the very crowded, almost sessile leaves, which are thick and not transparent in a dry state, the few-flowered inflorescence, and the larger achenes. I saw but one male flower, from which the description is drawn.

PILEA PTEROCAULIS, Stapf, n. sp. Herba glaberrima, 3 ped. alta. Caulis crassus, *quadrialatus*, alis circa ¾ lin. latis. Folia opposita, æqualia vel subæqualia, *petiolo 2–3 lin. longo, basi* 1½–2½ *lin. lato suffulta*, lanceolata vel oblonga, 5½–7½ poll. longa, 1½ poll. lata, basi minute biauriculata, apice acuminata, acumine minute denticulato. cæterum integerrima, membranacea, supra nigro-viridia, subtus pallidiora, utrinque

cystolithis crebris linearibus conspersa, trinervia, nervis ad acumen productis, venis transversalibus distinctis. Stipulæ inter folia cicatricem transversam conspicuam relinquentes. Flores *masculi* in glomerulis parvis in spicâ simplici vel parce compositâ, axillari, gracillimâ, $1\frac{1}{2}$ poll. longâ dispositi. Perigonium 4-partitum; segmenta ovata, $\frac{3}{4}$ lin. longa. Stamina 4. Ovarium rudimentarium minutum. Flores *feminei* in cymis axillaribus brevissimis, multifloris, glomeruliformibus. Perianthium 3-partitum; segmenta valde inæqualia, intermedium demum $\frac{1}{2}$ lin. longum, lateralibus 3-plo majus. Achænium suboblique globoso-ovoideum, valde compressum, $\frac{3}{4}$ lin. longum.

On the Tampassuk River, alt. 3000 feet (*Haviland*, 1229).

Allied to *P. smilacifolia*, Wedd., but very distinct by the winged stem and the very short and broad petioles.

Pilea crassifolia, Stapf, n. sp. Herba glaberrima. Caulis quadrangularis, sulcatus, flavido-virescens. Folia opposita, subæqualia, petiolo $1\frac{1}{4}$–$1\frac{1}{2}$ poll. longo suffulta, oblonga vel oblanceolata, 2–3 poll. longa, 7–9 lin. lata, basi minute biauriculata, apice acuminata, in margine, basi exceptâ, *crenato-denticulata, crassa,* exsiccando nigro-viridia, subtus pallidiora, *utrinque cystolithis creberrimis obsita, et minute nigropunctata.* Flores *masculi* in glomerulis densis, parvis, in spicis plerumque parce compositis, solitariis vel paucis, in axillis foliorum dispositis. Perigonium 4-partitum; segmenta ovata. Stamina 4. Ovarium rudimentarium minutum. Flores *feminei* pauci cum masculis in centro glomerulorum. Perianthium tripartitum; segmentum intermedium lateralibus majus, cucullato-obovatum, apiculatum. Ovarium ovoideum; stigma incrassatum.

At 3000 feet (*Haviland*, 1339).

Allied to *P. smilacifolia*, Wedd., but distinct by the very thick and crenulate-denticulate leaves, the transversal veins of which are hardly visible, and the abundance of cystoliths, amongst which black dots are scattered over the lower surface of the leaves. A Philippine specimen from the island of Panay (*Vidal*, 3863) comes still nearer, but it has rather asymmetric leaves, with very unequal and often short petioles.

Elatostemma lineare, Stapf, n. sp. ♂. Caulis, ut videtur, arborum truncis ramisve appressus et *applanatus, fulvo-strigillosus,* internodiis 4–6 lin. longis. Folia alterna, disticha, petiolo 1–2 lin. longo suffulta, *late linearia vel lanceolato-linearia,* $1\frac{1}{2}$–$2\frac{1}{2}$ poll. longa, 4 lin. lata, basi inæqualia, in latere extus spectante in petiolum auriculatum decurrentia, acuta, a medio vel in summâ tertiâ parte *grosse arguteque dentato-serrata,* crassiuscula, supra demum quidem glaberrima, luride glauco-viridia, sparse nigro-punctata, subtus in costâ necnon in nervis adpresse strigillosa, pallide fusca, punctulis crebris obsita, nervis lateralibus *subpatulis* utrinque 8–11, *sæpe valde indistinctis* vel parenchymate plane obtectis. Stipulæ oblique ovatæ, acutæ vel acuminatæ, membranaceæ, 3–4 lin. longæ. Cymæ capitatim contractæ, brevissime pedunculatæ vel sessiles, $1\frac{1}{2}$–2 lin. dimetientes; bracteæ extimæ late ovatæ, apice incrassatæ, pilosulæ, vix 2 lin. longæ latæque, interiores oblanceolatæ vel spathulatæ,

angustæ, ciliatæ, vix breviores. Perianthium 4–5-partitum, 1 lin. longum; segmenta late obovata, paulo cucullata et sub apice cornuta, dorso pilosa. Ovarii rudimentum minutum.

Kinitaki River, alt. 5000 feet (*Haviland*, 1271).

Allied to *E. rupestre*, Wedd., but differing by the evidently flattened and strigillose stem, the narrow leaves, which have almost parallel margins, a very coarse serrature, and a usually very indistinct nervation.

ELATOSTEMMA LOWII, Stapf, n. sp.—♀. Herba erecta, inflorescentiis exceptis *glaberrima*. Caulis inferne crassiusculus, nigricans, superne (exsiccatus quidem) sulcatus, ramis gracilibus. Folia alterna, sessilia vel petiolo brevissimo tenui suffulta, oblique oblongo-lanceolata, $1\frac{1}{2}$–2 poll. longa, 5–7 lin. lata, *basi in latere exteriore subauriculatim producta, in latere interiore plerumque sensim attenuata, apice breviter vel caudato-acuminata, a medio vel fere a basi grosse crenato-dentata*, tenuiter membranacea, supra nigricantia, subtus fuscescentia, sæpe ob stomata prominula minute albo-punctulata, *cystolithis utrinque* (*specie quidem*) *nullis*, triplinervia, nervis lateralibus patulis utrinque 5–7, tenuibus. Stipulæ subulatæ, $\frac{1}{2}$–1 lin. longæ. Cymæ axillares, foliis sæpe admodum diminutis sustentæ, sessiles, in receptaculum confluentes, 1–$1\frac{1}{2}$ lin. dimetientes; bracteæ omnes anguste lineares vel spathulato-lineares, molliter pilosæ, 1–$\frac{1}{2}$ lin. longæ; pedicelli vix $\frac{3}{4}$ lin. longi. Perianthium tripartitum; segmenta filiformi-linearia, pilosula. Staminodia paulo longiora vel breviora. Achenium ovatum, $\frac{1}{3}$ lin. longum, pericarpio tenui, leviter tuberculato.

At 5000 feet, on the northern face of Mount Kinabalu (*Low*).

I have not been able to identify this plant with any of the species represented in the Kew Herbarium; only two, viz. *E. Urvilleanum*, Brongn., and *E. lancifolium*, Wedd., seem to come very near it. The former is figured in Brongniart, Bot. Voy. Coq. t. 46, fig. A, and is evidently very like in habit. But the leaves are more cuneate at the base in *E. Urvilleanum*, less acuminate, and full of cystoliths. The figure of the female flower as given by Brongniart is possibly wrong, as it shows only two perianth-segments and no staminodes. *E. lancifolium*, on the other hand, has a strigose stem and entire or sub-entire leaves, which are hairy below.

ELATOSTEMMA THALICTROIDES, Stapf, n. sp.—♂. (Pl. XIX. B. 5–8.) Caulis *gracilis*, firmus, teres, adpresse hirtellus; ramuli *gracillimi, distiche foliati*. Folia alterna, brevissime petiolata vel sessilia, suboblique *cuneato-ovata*, 6–9 lin. longa, 4 lin. lata, *supra medium in uno latere extus spectante dentibus* 2 *majusculis, in altero plerumque dente unico magno vel alio parvo addito*, dentibus mucronulatis, membranacea, supra læte viridia, pilis perpaucis adpressis conspersa, cæterum glaberrima, subtus pallidiora, in nervis et in margine adpresse tenuiterque strigillosa, nervis lateralibus tenuibus numero dentium. Stipulæ lanceolatæ, strigillosæ, vix $\frac{1}{2}$ lin. longæ. Cymæ axillares, paucifloræ, in glomerulos 1–$1\frac{1}{2}$ lin. dimetientes congestæ, dense pilosæ; bracteæ extimæ rotundato-ovatæ vel obovatæ, sub apice breviter mucronulatæ, dorso dense et rigide pilosæ; interiores spathulatæ, basi valde attenuatæ,

$\frac{3}{4}$–$\frac{1}{2}$ lin. longæ; pedicelli $\frac{3}{4}$–$\frac{1}{2}$ lin. longi. Perianthium ad medium 5-lobum; lobi 2 exteriores ovati, acuti, interiores cucullati, dorso sub apice filiformiter cornuti, omnes extus rigide pilosi.

At 5000 feet (*Haviland*, 1219).

A very graceful plant, the foliage of which imitates the compound leaves of certain forms of *Thalictrum minus*, particularly in the shape of the leaflets. It is allied to *E. podophyllum*, Wedd., but distinct by the cuneate base of the leaves and the absence of conspicuous cystoliths.

Elatostemma bulbothrix, Stapf, n. sp. (Pl. XIX. a. 1–4.) Herba humilis, ut videtur prostrata. Caulis *firmulus*, teres, superne dense strigilloso-hirtellus, internodiis 2–3 lin. longis. Folia alterna, disticha, sessilia vel subsessilia, oblique obovata, 6–8 lin. longa, 3–5 lin. lata, basi in altero latere extus spectante rotundato-auriculata, in altero acutata, obtusa, obtusiuscule dentato-crenata, *firma, crassa*, supra flavido-viridia, *rugosa, densissime cystolithis obducta, sparse nigro-punctata*, glabra, subtus in costâ nervisque et in margine *adpresse strigillosa, in parenchymate pilis basi incrassatis et nitide aureis cæterum albis minute hispida*, triplinervia, nervis venisque supra valde impressis, subtus eximie prominentibus. Stipulæ minutæ, inæquales, una extus spectans subulata, altera lanceolata vel ovata, strigillosæ, vix 1 lin. longæ. Cymæ biflorae, sessiles, axillares; bracteæ exteriores anguste oblongæ, vix 1 lin. longæ, interiores diminutæ, spathulato-lineares vel fere subulatæ, omnes firmulæ, breviter strigillosæ; pedicelli brevissimi. Perianthium nullum. Staminodia 4, subquadrata. Ovarium ellipsoideum, minute quadricostatum, læve, vix $\frac{1}{2}$ lin. longum.

At 10,000 feet (*Haviland*, 1392).

A very marked species, the affinity of which is difficult to ascertain. Perhaps it lies with *E. glaucescens*, Wedd. I do not know any other species where the cystoliths are so crowded on the upper surface of the leaves, which they cover entirely, with the sole exception of the black dots. The stiff short bristles of the lower surface are thickened at the base, and, in a young state at least, shining and yellow, so as to make it glitter from minute golden-yellow dots.

Elatostemma lithoneurum, Stapf, n. sp. (Pl. XIX. c. 9–16.) Herba, ut videtur, prostrata. Caulis superne patule hirsutus, inferne glabratus, nigrescens, et albido-verrucosus. Folia alterna, disticha, sessilia vel subsessilia, oblique oblanceolata, interdum subfalcata, 2–2$\frac{1}{2}$ poll. longa, $\frac{1}{2}$–$\frac{3}{4}$ poll. lata, basi in uno latere extus spectante auriculato-producta, in altero acuta, breviter vel indistincte acuminata, fere a basi argute dentata, *crassa*, supra nigricantia, adpresse setulosa, subtus pallidiora in costâ nervisque necnon in parenchymate *setoso-hirsuta*, cæterum glandulis 3–4-cellularibus fuscis conspersa, triplinervia, nervis lateralibus (præter subbasalia) 5–7 in latere majore, valde prorsus arcuatis, nervis supra subimpressis, subtus prominulis et *cystolithis crassis albis obsitis*. Stipulæ oblanceolatæ, sæpe subfalcatæ, obtusiusculæ, 5 lin. longæ, membranaceæ. Cymæ *masculæ* in capitulis depresso-globosis 6 lin. dimetientibus, pedunculo $\frac{1}{2}$–1$\frac{1}{2}$ poll. longo hirsuto suffultis; bracteæ extimæ late rotundato-ovatæ, obtusæ, sub apice breviter obtuseque cornutæ,

nervis 3–5 subprominentibus, parce setulosæ, 4–4½ lin. longæ latæque, nigrescentes, interiores gradatim angustiores et in formam spathulatam cucullatam abeuntes, omnes cystolithis albis paucis vel pluribus conspersæ et margine ciliatulæ; pedicelli breves. Perianthium 4-partitum, 1 lin. longum, extus parce setulosum; segmenta obovata, valde cucullata, bina majora sub apice cornuta, bina angustiora gibboso-cornuta. Cymæ *femineæ* axillares, in receptaculum collectæ, sessiles, 2 lin. dimetientes, multifloræ; bracteæ extimæ ellipticæ, sub apice cornutæ, 1½ lin. longæ, interiores sensim angustiores et in formam cucullato-spathulatam abeuntes, dorso setulosæ; pedicelli demum elongati, ⅓ lin. longi. Perianthium nullum. Staminodia 3 minuta. Achenium ellipsoideum, supra medium tenuiter 4-costulatum, ⅓ lin. longum.

Behind boulders of torrents, alt. 11.000 feet (*Haviland*, 1206).

In the shape of the leaves and in the floral structure some resemblance to *E. papillosa*, Wedd., is evident, but *E. lithoneurum* differs by the much firmer leaves and the coarser indumentum. There are no cystoliths visible, at least from outside, except on the nerves beneath, which are covered with thick, wedge-shaped cystoliths. In any case it is a very well-marked species.

MYRICACEÆ.

MYRICA JAVANICA, Blume, Bijdr. 517, Fl. Jav. (Myric.) p. 1. t. 7, ♂ (*forma alpina*).

From 11,000 to 11,500 feet (*Low; Haviland*, 1091).

Distribution: Malaya; Java, Borneo.

The leaves are much smaller than in the type, but all other characters point so clearly to *M. javanica* that I have no doubt in referring this plant to it. It is evidently a stunted alpine form. The leaves are 1–1¼ by ½–¾ in. Low's specimen, consisting of a few male scraps, is enumerated erroneously under *Quercus monticola*, King, in Ann. Bot. Gard. Calc. ii. 44.

CUPULIFERÆ.

QUERCUS HAVILANDII, Stapf, n. sp. (Pl. XVIII. A. 1–4.) Arbor humilis. Ramuli dense brevissimeque fulvo-furfuraceo-tomentelli. Folia petiolo crassiusculo, furfuraceo-tomentello, 2–2½ lin. longo suffulta, *late ovata*, 1¾–2¼ *poll. longa*. 1¼–1½ *poll. lata*, basi late rotundata vel subtruncata, abrupte breviterque acuminata, coriacea, supra exsiccando castanea, primo fulvo-furfuracea, mox, costâ nervisque exceptis, glabrata, subnitida, subtus densissime atque persistenter ochraceo-furfuraceo-tomentosa, nervis lateralibus utrinque 10–12, supra impressis, infra prominentibus, venis transversis tenuibus. Stipulæ minutæ deciduæ. Spicæ androgynæ vel subunisexuales vel unisexuales, terminales et ex axillis summis, simplices vel compositæ, folia paulo superantes, dense furfuraceo-tomentellæ. Flores *masculi solitarii* (an semper?) in axillis *bractearum minutarum illis multo breviorum*; bracteolæ 2 minutæ. Perianthium 6-partitum; segmenta ovata, obtusa, ½ lin. longa. Stamina 8–10. Flores *feminei* in spicis propriis quam masculæ brevioribus vel ad basin spicarum androgynarum; bracteæ minutæ, ovatæ. Perianthium 4–6-lobatum. Styli, apice

excepto, pubescentes. Cupulæ per paria a dorso connatæ (vix maturæ), 6 *lin. dimetientes et* 2 *lin. altæ*, fulvo-tomentosæ, ob apices squamarum liberos nigro-tuberculatæ; glans depresso-hemisphærica, apice excepto glabra, lucida, apiculata, 3–4 lin. alta.

From 9,000 to 10,500 feet (*Haviland*, 1069).

Closely allied to *Quercus pruinosa*, Blume. I should have considered this oak as a form of *Q. pruinosa*, but for the very minute bracts, the solitary male flowers, and the small leaves and fruits, and I am still very doubtful whether all these characters may prove to be the result of the physical conditions of a much elevated and exposed locality.

A specimen from Lepanto, N. Luzon (*Vidal*, 1814), belongs evidently to the same species, but the leaves are less rounded at the base. There are no flowers or fruits with it.

CASTANOPSIS sp. aff. *C. argenteæ*, A.DC.

"Small tree, fruit prickly like an opened chestnut," at 8000 feet (*Haviland*, 1115).

I have seen only a barren branch. The nerves are rather faint and more curved than in *C. argentea*. It is very probably a new species.

CASTANOPSIS TURBINATA, Stapf, n. sp. Arbor humilis. Ramuli robusti, minute denseque tomentelli. Folia petiolo crasso 3 lin. longo suffulta, ovata vel ovato-oblonga, 3–4 poll. longa, $1\frac{1}{2}$–$1\frac{3}{4}$ poll. lata, basi rotundata vel breviter acuta, apice sensim tenuiterque acuminata, *valde coriacea*, supra exsiccando fusca vel obscure olivacea, subnitida, *sub lente valido pilis stellatis minutissimis albis parce conspersa*, subtus viridi-cinerea, pube stellatâ laxâ minutissimâ vestita, nervis lateralibus utrinque 9–10 sub margine insigniter arcuatim anastomosantibus, supra graciliter impressis, subtus prominentibus, venis transversis subtus tenuibus distinctis. Flores feminei in apice ramulorum, in spicis valde abbreviatis, minute cinereo-tomentellis, subglomerati. Cupula *turbinata*, bracteis squamiformibus, ovatis, superioribus plerumque breviter et abrupte vel sensim acuminatis, *eximie in spirocyclis primo arcte congestis, demum plus minusve solutis* dispositis ornata, minutissime tomentella, et insuper glandulis minimis aspersa. Perianthium 6-lobum, ad loborum apices in cupulâ inclusum. Styli basi pubescentes.

At 8500 feet (*Haviland*, 1102).

Allied to *C. sumatrana*, A.DC., but distinct by the minute stellate tomentum, the very coriaceous leaves and the turbinate cupula, which bears a spiral of bracts of 5–7 whorls. The largest cupula is about 7 lin. long and 4 lin. broad in the upper part; when young the cupula is more cylindric, measuring $2\frac{1}{2}$ by 2 lin.

BURMANNIACEÆ.

BURMANNIA PAPILLOSA, Stapf, n. sp. Herba annua, chlorophyllo destituta, aphylla. Caulis circa 3-pollicaris, simplex vel furcatus, basin versus squamis paucis minutis obsitus, uniflorus, sub flore bibracteatus vel nudus; bracteæ lanceolatæ, $1\frac{1}{2}$ lin. longæ, hyalinæ. Perigonii tubus 2 lin. longus, ovarium fere duplo superans, trialatus, *alis apice abrupte basin versus longe attenuatis*, ad $\frac{3}{4}$ lin. latis; lobi exteriores rotundati, obtusi, in margine et in dorso superne minutissime papillosi, $\frac{3}{8}$ lin. longi latique, *interiores* 6-*plo breviores*, late rotundati, minutissime papillosi. Antheræ sessiles, *transverse latiores*; connectivum apice in cristulas 2 ovatas vel rotundas

fimbriato-denticulatas productum, basi *brevissime calcaratum*. Ovarium 1 lin. longum; stylus cylindricus, apice breviter tribrachiatus, labio stigmatis infero intus papilloso.

Penokok River, alt. 3200 feet (*Haviland*, 1329).

This species is evidently closely allied to *Burmannia lutescens*, Becc., and *B. tridentata*, Becc. It differs, however, from the former in the shape of the flower, which is obovate, and in the anthers, which are broader than long; from the latter by the presence of distinct though very small inner perianth-lobes and the exceedingly short spur of the anthers.

BURMANNIA LONGIFOLIA, Beccari, Mal. i. 244, t. xiii. f. 1–5.

North-west face of Mount Kinabalu at 5000 feet (*Low*).

Distribution: Throughout Malaya, from Perak to North Borneo and New Guinea.

ORCHIDEÆ.

(By H. N. RIDLEY, F.L.S.)

MICROSTYLIS CALOPHYLLA, Reichb. fil. in Gard. Chron. xii. (1879), 718.

Penokok River, alt. 3000 feet (*Haviland*).

PLATYCLINIS GRANDIFLORA, Ridl., n. sp. Rhizoma lignosum, fibrosum, radicibus crassis. Pseudobulbi congesti, subteretes, $1\frac{1}{2}$ poll. longi. Folium 4 poll. longum, $\frac{3}{4}$ poll. latum, lanceolatum, acutum, nervis 4 cum costâ prominulâ. Scapus gracilis, nutans, circiter 8 poll. longus. Flores subremoti, circiter 20, mediocres. Bracteæ $\frac{1}{4}$ poll. longæ, convolutæ, late oblongæ, acutæ, ovariis cum pedicellis paulo breviores. Sepala lanceolata, acuta, $\frac{3}{8}$ poll. longa, lateralia obliqua. Petala angustiora et breviora, lanceolata, acuta. Labellum quadratum, angulis acutis, apiculatum, apiculo quam anguli producti vix longiore, lamellis semicircularibus, crassis ad laminæ basin, et inter eas callo mammillari minus elevato instructum. Columna arcuata, processubus linearibus e basi exortis.

At 10,500 feet (*Haviland*).

The flowers, which are apparently brown, are rather large and few for the genus.

PLATYCLINIS CORRUGATA, Ridl., n. sp. Rhizoma gracile, pseudobulbis ovoideo-globosis, flavis, semi-pollicaribus, corrugatis dense tectum. Folium lineari-lanceolatum, subacutum, petiolatum, lamina 2 poll. longâ, $\frac{1}{4}$ poll. latâ, petiolo pollicari, nervis in laminæ dorso tribus elevatis. Scapus gracilis, 8 poll. longus, racemo subdenso, multifloro. Flores parvi. Sepala ovata, caudata, $\frac{1}{8}$ poll. longa. Petala lanceolata, acuminata, minora. Labellum cymbiforme, breve, tenue, si explanatum ovatum, acuminatum, lobis lateralibus brevibus truncatis, et cum margine lobi medii denticulato. Callus in disco carnosus, magnus, hippocrepiformis, paulo elevatus. Columna parva, brachiis parvis oblongis truncatis e basi exortis, clinandrii margine brevi, integro, vix elevato. Rostellum elongatum, suberectum, integrum, linguiforme. Columnæ venter infra stigma protrusum.

Maripari Spur, alt. 5500 feet (*Haviland*).

PLATYCLINIS STACHYODES, Ridl., n. sp. Rhizoma lignosum, pseudobulbis cylindrico-conicis, arcte appressis, 1 poll. longis, $\frac{1}{8}$ poll. crassis (exsiccatis). Folia linearia falcata, coriacea, 5-nervia, striolata, 3 poll. longa, $\frac{1}{4}$ poll. lata. Scapus gracilis, teres, 5-poll. longus, superne racemosus. Racemus compactus, 2 poll. longus, multiflorus. Bracteæ glumaceæ, ovatæ, 7-nerviæ, acutæ, $\frac{1}{8}$ poll. longæ, ovaria superantes. Flores minores. Sepala lanceolata, acuta, $\frac{1}{4}$ poll longa. Petala subsimilia, latiora. Labellum subæquilongum, lanceolatum, acutum, lobis lateralibus brevibus, subovatis, falcatis, obtusis, irregulariter sinuoso-dentatis, lobo medio multo longiore, lanceolato, acuto; callus ad basin cuneato-quadratus, emarginatus, nervis elevatis 2 ex angulis in laminam extensis. Columna brevis, lata, margine clinandrii dorsali quadrato, elevato, tridentato, brachiis lateralibus nullis. Rostellum semiovatum, crassum.

At 11,000 feet (*Haviland*).

An elegant little plant, with the large conspicuous bracts so common in the genus, and a compact raceme, reminding one of an ear of wheat, whence the specific name.

DENDROBIUM KINABALUENSE, Ridl., n. sp. Rhizoma longe repens, ramosum, angulatum, gracile, radicibus paucis, teretibus, gracilibus, longis. Pseudobulbi $\frac{1}{2}$ poll. longi, quadrati, $\frac{1}{4}$ poll. lati, 1 poll. dissiti. Folia solitaria, elliptica vel elliptico-ovata, brevissime petiolata, obtusa, coriacea (sicca polita, striata), 2 poll. longa, fere 1 poll. lata, vel minora. Racemus ex apice pseudobulbi exortus, brevis, $\frac{1}{2}$ poll. longus. Flores majusculi 2–3. Bracteæ late lanceolatæ, $\frac{1}{4}$ poll. longæ. Pedicelli $\frac{3}{4}$ poll. longi, graciles. Sepala lanceolata acuta, $\frac{3}{4}$ poll. longa. Mentum breve, latum, $\frac{1}{4}$ poll. longum. Petala lanceolata, mucronata, sepalis minora. Labellum trilobum; lobi laterales lati, $\frac{1}{4}$ poll. longi, subfalcati, obtusi, lobus medius angustior, paulo longior; carina mediana paulo elevata, obtusa, abrupte in dimidio disci terminata, lamellis brevibus duabus semicircularibus versus basin lobi medii. Columna longiuscula, filamento longo, clinandrio profundo, ventre excavato. Capsula angusta, falcata, $1\frac{1}{4}$ poll. longa, costis æqualibus linearibus.

At 7000 feet; epiphytic (*Haviland*).

This is quite an aberrant plant, with a branching stem, from which on one side rise a number of distant short branches which represent the pseudobulbs, from the apex of which arise the racemes. I think it is best referred to the section *Sarcopodium* at present, but it differs much in habit from the others of this section.

BULBOPHYLLUM MONTENSE, Ridl., n. sp. Rhizoma elongatum, gracile, tenue, internodiis semipollicaribus oblongis, apicibus sursum curvatis. Folium in unoquoque internodio oblanceolatum, obtusum, petiolatum, apice emarginatum, $\frac{3}{4}$–1 poll. longum, $\frac{1}{8}$ poll. latum. Scapi capillares, $1\frac{1}{2}$–2 poll. longi, e basibus internodiorum assurgentes. Flores solitarii, terminales, pedicellis pollicaribus, gracilibus. Ovaria perparva. Sepalum posticum $\frac{1}{2}$ poll. longum, $\frac{1}{8}$ poll. latum, lateralia paulo longiora et latiora, oblongo lanceolata, acuta, 5-nervia, flava. Petala oblonga, obtusa, tenuia, vix $\frac{1}{8}$ poll. longa. Labellum linguiforme, carnosum, curvum, breve, exsiccando purpureum. Columna pede elongato assurgente. Stelidia longa, subulata, acuta. Capsula (immatura) $\frac{1}{2}$ poll. longa, obliqua.

Epiphytic; sepals and petals veined orange yellow; at 11,000 feet (*Haviland*, 1099). This species with the next, belongs to a small series of very small plants characterized by the moniliform rhizome, every node of which normally produces a single leaf, and at intervals throws up a slender pedicel terminated by a single flower, the lateral sepals of which are longer than the upper one.

Bulbophyllum striatellum, Ridl., belonging to the same section, has been unfortunately somewhat confused with *B. concinnum*, Hook. fil., Ic. Pl. t. 2038, as by an accident the stelidia in the diagram of its fertilization (Annals of Botany, iv. no. xv. pl. xxii.) have been represented too long. The shape of the petals alone would show that the two plants are utterly distinct. *B. concinnum*, Hook., belongs to the capitate group with distinct pseudobulbs (*B. leptanthum*, Hook., &c.). *B. striatellum* resembles this group in its vegetative organs, but is distinct in its single flower with oblong caudate sepals.

BULBOPHYLLUM CATENARIUM, Ridl., n. sp. Rhizoma ramosum, internodiis oblongis, apicibus sursum curvatis, moniliforme, pallide viride. Folia erecta, $\frac{1}{4}$ poll. longa, $\frac{1}{4}$ poll. lata, elliptica, obtusa, pallide virentia. Scapus filiformis, pollicaris, uniflorus. Bractea minuta ovata. Pedicellus longus capillaris. Flos parvus, late expansus. Sepalum posticum lanceolatum, obtusum, lateralia latiora, triente longiora, aurantiaca, rubro-striata. Petala lanceolata, trientem sepali postici æquantia, flava, lineâ medianâ rubrâ. Labellum breve, linguiforme, ovatum, acutum, carnosum, papillosum, medio canaliculatum, atro-kermesinum, canaliculo obscuriore. Columna recta, longiuscula, pede longo, apice sursum curvato, libero, roseo. Anthera depressa, margine integro, papillosa. Stelidia longa, suberecta, dentiformia, acuminata, acuta.

Amongst wet mosses on shrubs and trees, alt. 6500 feet (*Haviland*, 1164).

Distribution: Malay Peninsula, on Mt. Bukit Hitam in the district of Selangor, at 2000 feet (*Kelsall*); in mangrove jungle at Kranji near Singapore.

This curious little species seems to have a wide distribution. I am quite unable to distinguish between the Kinabalu plant and that of the Singapore mangrove swamps. It is very abundant in the latter locality, but seldom flowers.

BULBOPHYLLUM CORIACEUM, Ridl., n. sp. Rhizoma crassum, lignosum, radicibus crassis. Pseudobulbi nulli. Folia $1\frac{1}{2}$ poll. dissita, coriacea, crassa, oblongo-lanceolata, $2\frac{1}{2}$ poll. longa, $\frac{3}{4}$ poll. lata, petiolis $\frac{3}{4}$ poll. longis canaliculatis. Scapi foliis approximati, 5 poll. longi, validi, basi vaginati, superne laxe racemosi. Flores flavi, circiter 13, pro sectione magni. Bracteæ lanceolatæ, acutæ, $\frac{1}{4}$ poll. longæ, quam pedicelli longiores. Sepalum posticum lanceolatum, acutum, lateralia subsimilia, inferne prolongata, $\frac{1}{4}$ poll. longa. Petala circiter dimidium sepali æquantia, oblonga, uninervia. Labellum linguiforme, carnosum, obtusum, marginibus incrassatis, canaliculo mediano, haud stipitatum. Columna pede recto, stelidiis triangularibus lanceolatis, acuminatis.

At 10,500 feet (*Haviland*, 1100).

A stout but not very large plant, with larger flowers than in most species of the section.

BULBOPHYLLUM MONTIGENUM, Ridl., n. sp. Rhizoma crassum. Caules basi dilatati, subbulbosi, breves, vaginis tecti, approximati. Folium oblongum, lanceolatum,

obtusum, petiolatum, 7 poll. longum, $\frac{3}{4}$ poll. latum, petiolo 1 poll. longo. Scapus folio approximato subæquilongus, gracilis, basi vaginis acuminatis pluribus fere pollicaribus, superne laxe racemosus. Flores plures, dissiti, $\frac{1}{4}$ poll. longi, pedicellis brevissimis. Bracteæ paleaceæ, pedicellis longiores. Sepala lanceolata, caudata, lateralia mentum saccatum formantia. Petala carnosa, papillosa, sepalis multo breviora. Labellum petalis æquilongum, oblongum, lanceolatum, obtusum, pubescens, margines basin versus involuti, approximati. Columna minima, stelidiis dentiformibus.

At 6000 feet (*Haviland*, 1252).

In this species the short stems on which the leaves are borne are slightly dilated, but hardly form real pseudobulbs.

BULBOPHYLLUM BREVIFLORUM, Ridl., n. sp. Rhizoma haud crassum, radicibus copiosis. Folia approximata, ebulbosa, lineari-lanceolata, petiolata, obtusa, carinata, lamina 4 poll. longa, $\frac{3}{8}$ poll. lata, petiolo bipollicari. Scapi debiles, pedales, graciles, a basi ad dimidium compressi, vaginis apice acutis exceptis nudi, superne laxe racemosi. Flores dissiti, parvi, caduci. Bracteæ lanceolatæ, acutæ, vix $\frac{1}{16}$ poll. longæ. Pedicelli $\frac{1}{8}$ poll. longi. Sepala lateralia ovata, acuta, $\frac{1}{8}$ poll. longa, posticum lanceolatum, ovatum. Petala linearia, oblonga, dimidio sepalorum longiora. Labellum tenue, oblongum, obtusum, petalis æquilongum, nervis tribus incrassatis, brevissime stipitatum. Columna alis latis, apice stelidiis erectis, majusculis, lineari-lanceolatis. Anthera subglobosa, breviter rostrata.

At 6000 feet (*Haviland*).

Another species of the Apodæ section, without any dilatation of the stem into pseudobulbs, differing remarkably from all others in the very long slender scapes and the very short-sepaled flowers. The little flowers have the thin texture of the section, and are apparently yellowish.

BULBOPHYLLUM ALTISPEX, Ridl., n. sp. Caulis ascendens, ramosus, radicibus tenuibus, copiosis. Pseudobulbi subremoti, $\frac{1}{4}$ poll. longi, cylindrici, vaginis striatis tecti. Folia elliptica, obtusa, carinata, $\frac{1}{2}$ poll. longa, $\frac{1}{4}$ poll. lata, carnosa. Racemi brevissimi, pauciflori, bracteis tecti. Flores parvi, rosacei. Bracteæ parvæ, ovatæ. Sepalum posticum oblongum, obtusum, $\frac{1}{4}$ poll. longum, lateralia ovata, triangularia, subacuta, multo latiora. Petala linearia, $\frac{1}{3}$ sepali æquantia. Labellum linguiforme, marginibus ad basin elevatis tenuibus, apice carnosulum, sepalis brevius, brevissime stipitatum. Columnæ stelidia securiformia, apicibus productis acuminatis, antheram obtusam superantia.

Epiphytic. At 8000 feet (*Haviland*, 1143).

Flowers pinkish. Near *B. capitatum*, Lindl., but with blunter sepals and fewer flowers.

DENDROCHILUM CONOPSEUM, Ridl., n. sp. Rhizoma longum, pseudobulbis cylindricis, remotis (1 poll. distantibus), pollicaribus. Folia elliptica, petiolata, 3 poll. longa, $\frac{3}{4}$ poll. lata, petiolo $\frac{1}{4}$ poll. longo. Racemi graciles, rhachi tenui, 3-pollicares. Flores perparvi, dissiti. Bracteæ ovatæ, acutæ, pedicellos æquantes. Sepala linearia, obtusa. Petala subsimilia, angustiora. Labellum breve, vix $\frac{1}{2}$ sepali æquans, panduratum,

a basi ad medium inter carinas duas canaliculatum, apice ovatum. Columna brevis, laciniis lateralibus e parte superiore longis, linearibus, incurvis.

Maripari Spur, alt. 5500 feet (*Haviland*).

ERIA SCORTECHINII, Stapf.—Syn. *E. Kingii*, Hook. fil. Fl. Brit. Ind. v. 790; Ic. Pl. t. 2066, non F. Muell.; *E. major*, Ridl. Caulis validus. Folia lineari-lanceolata, oblique acuta, acuminata, 15 poll. longa, $\frac{3}{4}$ poll. lata. Scapi plures (ad 12), lanuginosi, validuli, bracteolis parvis, ovatis, reflexis. Flores parvuli, deflexi, lanuginosi. Ovaria $\frac{1}{4}$ poll. longa. Sepalum posticum oblongum, lateralia ovata, lanuginosa. Petala linearia, glabra. Labellum ungue brevi calloso, lobis lateralibus brevibus, dentiformibus, medio ovato subacuto, callo tuberculo medio; discus inter lobos laterales carnosus, elevatus, lineâ medianâ depressâ. Capsula pollicaris, lanuginosa.

At 6000 feet (*Haviland*, 1250).

Rather bigger than the Perak plant and with a slightly different lip, but apparently specifically the same.

ERIA GRANDIS, Ridl., n. sp. Caulis validus, $\frac{3}{4}$ poll. crassus. Folia inferiora vaginanti superiora 18 poll. longa, $\frac{3}{4}$ poll. lata, linearia, acuminata, inæqualiter biloba, acuta, coriacea, multicostata. Scapi ex axillis superioribus orti 8 poll. longi, foliis breviores, fere in totâ parte exsertâ floriferi, rhachi lanuginosi. Bracteæ lanceolatæ, acutæ, $\frac{1}{4}$ poll. longæ, glabræ. Ovarium cum pedicello $\frac{1}{2}$–1 poll. longum, lanuginosum. Flores pro sectione magni. Sepalum posticum lanceolatum, $\frac{3}{8}$ poll. longum, lateralia ovata, acuta, latiora, mentum rotundatum formantia, alba, pubescentia. Petala breviora $\frac{3}{16}$ poll. longa, ovata, lanceolata, tenuiora, glabra. Labellum roseum, saccatum, quam petala brevius, marginibus anticis incrassatis, lobo medio brevissimo rostriformi. Columna rosea, majuscula, basi angusta, stelidiis erectis latis, apicibus dilatatis, clinandrio profundo reclinato. Anthera globosa, dorso fissa, emarginata. Stigma magnum, oblongum, callo parvo transverso ad basin columnæ.

Very common on the ground under jungle, from 10,000 to 12,000 feet (*Haviland*, 1157).

This plant is very remarkable on account of the curious saccate lip, something in the shape of a coal-scuttle. The front edges at the entrance to the sac are thickened, and just within them is on each side another thickened low ridge; the thickened edges are continued into a short thick beak, which is all that represents the mid-lobe.

ERIA ANGUSTIFOLIA, Ridl., n. sp. Caulis bipollicaris, foliis distichis equitantibus tectus. Folia subcoriacea, parte basali vaginante 2–3 poll. longâ, laminâ articulatâ 6–15 poll. longâ, $\frac{1}{2}$ poll. latâ, lineari-acuminatâ, apice valde inæquilobo, lobo uno $\frac{1}{2}$-pollicari. Racemus brevior, vix 6 poll. longus, ex axillâ folii superioris, multiflorus. Flores parvi, glabri, pedicellis $\frac{1}{4}$ poll. longis, minute et parce pubescentibus. Bracteæ ovatæ, reflexæ, $\frac{1}{8}$ poll. longæ. Sepalum posticum oblongum, obtusum, $\frac{1}{4}$ poll. longum, lateralia late ovata, 5-nervia, multo majora, $\frac{1}{8}$ poll. lata; mentum breve, latum. Petala ovata, subacuta, trinervia, dimidio sepali æquilonga. Label lum sepalo brevius, cymbiforme, lobis lateralibus triangularibus erectis, lobo medio longiore triangulari subobtuso, si explanatum rhomboideum, carinis 4, 2 interi-

oribus in lobo medio conjunctis, exterioribus crassioribus, sigmoideis, obscure pustulosis. Columna brevis, marginibus versus basin incrassatis, papillâ glandulosâ terminata, clinandrii marginibus anticis rotundatis.

At 6000 feet (*Haviland*).

A curious species, the affinity of which is not clear. The stem and foliage recall those of *Eria aeridostachya*, but the glabrous flowers and short mentum make it very distinct. The lip is boat-shaped, with little erect lobes. On the walls of the boat are two thick sinuous ridges, thickest at the base, and on the terminal lobe, between them, in the middle line, are a pair of less elevated ridges which meet and form one on the mid-lobe. The foot of the column is somewhat abruptly bent, and the edges are thickened to form two ridges which end in a rounded glandular mamilla a little above the lip. It is probable that these ridges excrete nectar, with which the boat-shaped portion of the lip is filled during life.

ERIA FEROX, Blume, Mus. Bot. Lugd. Bat. ii. 184.

At 6000 feet (*Haviland*).

SPATHOGLOTTIS AUREA, Lindl., in Journ. Hort. Soc. v. (1850), 34.

Kinitaki River, alt. 4000 feet (*Haviland*, 1291).

NEPHELAPHYLLUM LATILABRE, Ridl., n. sp. Rhizoma ascendens, vaginis papyraceis tectum. Folia ovato-cordata, petiolata, subacuta, 2 poll. longa, $1\frac{1}{2}$ poll. lata, petiolis $\frac{3}{4}$ poll. longis. Scapus bipollicaris, triflorus. Bracteæ magnæ, papyraceæ, oblongæ, $\frac{1}{2}$ poll. longæ, pedicellis æquilongæ. Sepala lanceolata acuta, $\frac{1}{2}$ poll. longa, $\frac{1}{8}$ poll. lata. Petala linearia, subæquilonga. Labellum calcare brevi, recto, $\frac{3}{8}$ poll. longo, ungue oblongo, limbo late reniformi, emarginato, $\frac{3}{4}$ poll. lato, in disco versus apicem lineis tribus papillosis. Columna lata, basi attenuata. Anthera plana.

At 6500 feet (*Haviland*, 1165).

Lip pink-veined, with oblong orange centre.

This species is allied to *N. pulchrum*, Blume, but differs in the broad reniform end of the lip, which has also three lines of small papillæ in the middle, increasing in size towards the apex.

CŒLOGYNE PAPILLOSA, Ridl., n. sp. Rhizoma lignosum, crassum; pseudobulbi elongati, cylindrici, 3-pollicares. Folia lanceolata, longe petiolata, acuta, 7-nervia, 8 poll. longa, 1 poll. lata, petiolo 3-pollicari. Scapus e pseudobulbo haud evoluto, foliis partim evolutis, validulus, erectus, 15 poll. longus. Racemus flexuosus, 4 poll. longus. Flores ad 6, mediocres, dissiti. Bracteæ oblongæ, ovatæ, subacutæ, 1 poll. longæ, $\frac{1}{2}$ poll. latæ, striatæ (siccæ brunneæ), pedicello cum ovario paulo longiores. Sepala lanceolata, $\frac{3}{4}$ poll. longa. Petala alba, subsimilia, angustiora. Labellum oblongum, sepalis subæquilongum; lobi laterales parvi, obtusi, vix distincti, medius ovatus, disco dense papilloso, carinis sinuatis ad 9 inter lobos laterales. Columna basi angusta, superne alis magnis, triangularibus, subacutis, clinandrium superantibus. Anthera plana, ovata.

At 10,500 feet (*Haviland*, 1098).*

The stiff, tall scape, with a few flowers at the apex, the short, papillose lip, and the large bracts are peculiar marks of this species.

CALANTHE OVALIFOLIA, Ridl., n. sp. Folia late ovata, petiolata, acuta, lamina 9 poll. longa, 5 poll. lata, glabra, petiolo 5 poll. longo. Scapus elatus 3-pedalis, pubescens; racemus multiflorus, laxus. Flores parvi. Bracteæ lanceolatæ, acutæ, ½ poll. longæ, pubescentes. Pedicelli fere 1 poll. longi, pubescentes. Sepala ovata, reflexa, ¼ poll. longa, ⅛ poll. lata, pubescentia. Petala obovata, spathulata, glabra. Labellum late ovatum, integrum, sepalis subæquilongum, ad basin lamellis duabus pubescentibus instructum. Calcar sepalis brevius, vix ¼ poll. longum.

Penokok River, alt. 3000 feet (*Haviland*).

One of the very few species with entire lip.

CALANTHE PARVIFLORA, Lindl., in Paxt., Fl. Gard. iii. (1852–1853), 37. t. 61.

At 7000 feet (*Haviland*).

"Corolla white, lip with a central orange spot."

This plant fits very well with the short description in the 'Folia Orchidacea,' which was based on a plant collected by Lobb in Java.

BROMHEADIA RIGIDA, Ridl., n. sp. Caulis validus, ultrapedalis. Folia subdisticha, coriacea, linearia, obtusa, apice emarginato, 5 poll. longa, ⅜ poll. lata, vaginis teretibus, ½ poll. longis, ore integro. Flores terminales pauci in racemo brevissimo. Bracteæ magnæ, late ovatæ, coriaceæ, striatæ, fere ½ poll. longæ. Pedicelli bracteis æquilongi. Sepala lanceolata, acuta, ½ poll. longa. Petala breviora, paulo latiora. Labellum trilobum, lobis lateralibus angustis, acutis, medio oblongo-obovato, margine crispo, disco elevato trinervio. Columna erecta, gracilis, alata, clinandrii margine sinuato. Rostellum planum, late semiovatum.

At 6000 feet (*Haviland*, 1251).

"Sepals and petals exteriorly, column anteriorly with purple markings, lip with ill-defined yellow centre." A very distinct species, with stiff, narrow leaves. Most nearly allied to an undescribed species from Mt. Ophir.

APPENDICULA CONGESTA, Ridl., n. sp. Caules 8 poll. longi, teretes. Folia tenuia, oblonga obtusa, multinervia, apice inæqualiter bilobo, lobis obtusis, vaginis ¼ poll. longis, superne dilatatis, papyraceis, ore integro. Racemus terminalis, capituliformis, compactus, ½ poll. longus, multiflorus. Bracteæ flabellatæ, fimbriatæ, papyraceæ, pallidæ, ¼ poll. longæ et latæ (superiores minores). Flores parvi. Sepala ovato-lanceolata, acuta, lateralia mucronata, alba, exsiccando fasciâ medianâ rubrâ. Petala angustiora et breviora, lanceolata, mucronulata. Labellum liberum, carnosum, ovatum, acutum, sepalis brevius, disco elevato, hippocrepiformi, ad basin rubro, callo parvo albo in apice labelli; calcar magnum, scrotiforme. Columna brevissima. Anthera tenuis, lanceolata. Pollinia 6, elongata, clavata, tenuia, translucentia, disco

* From 8000 to 10,000 feet (Low).—STAPF.

tenui, cuneato, magno, apice emarginato, subtus ad apicem glandulâ rubrâ, bicruri, crassâ instructo. Rostellum latum, tenue, oblongum, emarginatum. Stelidia acuta, erecta, rostellum subæquantia, carnosa, rubra. Stigma latum.

Penokok River, alt. 11,000 feet (*Haviland*, 1302).

This is a very singular species, belonging to the series with strictly terminal inflorescence. The raceme forms a compact cone with large, pale, fimbriate bracts. The flowers project but a short way, and appear to have been white with a median red bar on each sepal and petal, and a red horseshoe-shaped patch on the lip. The pollinia, too, are very curious; they are 6 in number, very slender, and fixed in the middle of a thin-textured disc, very large in proportion to them; at the end of this disc is a Λ-shaped, thick, red, gland-like body, which doubtless serves to attach it to the head of the fertilizing insect.

Habenaria borneensis, Ridl., n. sp. Caulis 2-pedalis, undique foliatus. Folia ad 10, dissita, lanceolata, acuminata, cauli appressa, vaginantia, 1–1½ poll. longa, ⅜ poll. lata. Racemus laxus vel congestus, multiflorus, bracteis ovaria æquantibus, lanceolatis, acuminatis, ½ poll. longis, fere ¼ poll. latis. Flores mediocres, virides. Sepalum posticum lanceolatum, ¼ poll. longum, erectum, lateralia lanceolata, obtusa, deflexa. Petala erecta, lanceolata, sepalo postico breviora et angustiora. Labellum lineare, carnosum, integrum, ⅜ poll. longum, ad basin lobis erectis, minutis, triangularibus. Calcar æquilongum, teres, obtusum, pendulum. Columna lobis stigmaticis, brevibus, rotundatis. Antherarum apices haud producti. Pollinia elongata, piriformia, pedicello tenui, disco ovato.

At 10,000 feet (*Haviland*).

One of the very few simple-lipped Asiatic Habenarias. The two little erect processes at the extreme base of the lip, however, doubtless represent the lateral lobes.

SCITAMINEÆ.

Alpinia, sp. aff. *A. muticæ*, Roxb.

At 5000 feet (*Haviland*, 1233).

This is probably a new species, but the specimen is too young for description.

HÆMODORACEÆ.

Aletris foliolosa, Stapf, n. sp. Herba 1¼–2 ped. alta, glaberrima, rhizomate brevi. Folia *numerosa, ad scapi basin densissime conferta*, lineari-lanceolata, 1¼–3 *poll. longa*, basi 2–3½ lin. lata, longe tenuiterque acutata, plana vel subplicata vel marginibus involutis, sæpe leviter recurva, basi et sæpe superne distincte nervosa, 9–11-striata. Scapus 1–1½ ped. altus, *foliis* 15–20 *anguste linearibus vel filiformibus*, 4–2 lin. longis, basi gibbosis, bracteiformibus obsitus, in racemum 3–4½ poll. longum abiens; bracteæ filiformi-lineares, 2½–1½ lin. longæ; pedicelli ad medium vel paulo supra bracteolâ brevi obsiti, 4–2 lin. longi. Perianthium albidum, tubuloso-campanulatum, ad medium ovario adnatum, 6-fidum; lobi subæquales, subspathulato-lineares vel lineares, 1½–1¾ *lin. longi.* Filamenta basi lobis adnata, iisque

dimidio breviora; antheræ purpureæ. Ovarium semi-inferum, parte liberâ fere 1 lin. altâ; stylus $\frac{3}{4}$–1 *lin. longus, subtenuis*; stigma distincte incrassatum. Capsula 2–2$\frac{1}{2}$ lin. longa. Semina lineari-oblonga, tenuiter striata, vix $\frac{1}{2}$ lin. longa.

Maripari Spur, alt. 5500 feet; Temburungo, alt. 7700 feet (*Haviland*, 1125 *a*, 1125 *b*).

Distribution: Malaya, Sumatra, North Borneo.

Well marked by the very numerous, densely crowded, and comparatively short leaves, and the numerous reduced leaves on the scape. It was collected by Beccari also in Sumatra on Mt. Singalan (no. 167).

Aletris rigida, Stapf, n. sp. Herba 5–7 poll. alta, glaberrima, rhizomate brevi. Folia numerosa, ad scapi basin densissime conferta, linearia vel lineari-lanceolata, 1–2 poll. longa, basi 1$\frac{1}{2}$–1 lin. lata, longe acutata, plana vel subplicata vel marginibus involutis, rigide erecta, crassiuscula, basi exceptâ subenervia. Scapus 3–5 poll. altus, *rigidus, foliis bracteiformibus* 2 *lanceolato-lineari-subulatis* 4–6 *lin. longis* obsitus, in racemum 2–1 poll. longum abiens; bracteæ lanceolato-lineares, 4–2 *lin. longæ*; pedicelli brevissimi, basi bracteolâ brevi iis longiore obsiti. Perianthium albidum, tubuloso-campanulatum, ad medium ovario adnatum, 6-fidum; lobi lineares vel lineari-oblongi, 1–1$\frac{1}{2}$ *lin. longi.* Filamenta lobis basi adnata iisque dimidio breviora. Ovarium semi-inferum, parte liberâ vix $\frac{1}{2}$ lin. altâ, deinde magis protrusâ; stylus *brevis, crassiusculus*, $\frac{1}{2}$ lin. longus; stigma paulo incrassatum. Semina lineari-oblonga, tenuiter striata, vix $\frac{1}{2}$ lin. longa.

From 8000 to 11,000 feet (*Low*); in open damp places at 11,500 feet (*Haviland*, 1125 *c*).

Closely allied to *A. foliolosa*, but distinct by the rigid habit, the few reduced leaves on the scape, and somewhat smaller flowers, with a shorter and stouter style.

IRIDEÆ.

Patersonia Lowii, Stapf, n. sp. (Pl. XX. b. 7–9.) Planta 8–12 poll. alta. Caulis brevissimus. Folia circiter 12 cum scapo quoque, equitantia, linearia, longiora, 7–11 poll. longa, 1$\frac{1}{2}$–1$\frac{3}{4}$ lin. lata, acutissima, planissima, rigida, in marginibus brevissime scarioso-fimbriata, glaberrima, tenuiter sed distincte multistriata. Scapus 4–6 lin. longus, fere ad inflorescentiam folii intimi vaginâ amplexus. Spathæ 2, subæquales, lineari-oblongæ, acutæ, 1$\frac{1}{3}$ poll. longæ, 2 lin. latæ, striatæ, late scarioso-marginatæ. Bracteæ spathis similes, angustiores brevioresque, in carinâ dorsali plus minusve scarioso-fimbriatulæ, interdum unâ alterâve diminutâ vacuâ additâ. Perigonii tubus gracillimus, 11 lin. longus, vix exsertus; lobi exteriores elliptico-obovati, 5–7 lin. longi, circa 4–5 lin. lati, ut videtur, cærulei vel purpurei, interiores nulli (?). Filamenta in tubum integrum connata; antheræ 1$\frac{1}{2}$ lin. longæ. Stylus superne sensim pauloque incrassatus; lobi stigmatici obovato-spathulati, minute crenulati.

North-west face of Mount Kinabalu, alt. 5000 feet (*Low*); Maripari Spur, alt. 5500 feet (*Haviland*, 1259).

I find it very difficult to point out the affinity of this if compared with the Australian species. It may, perhaps, be considered as linked with *P. glauca*, R. Br., by way of the species next to be described.

PATERSONIA BORNEENSIS, Stapf, n. sp. (Pl. XX. A. 1–6.) Planta $1\frac{1}{2}$–$2\frac{1}{4}$ ped. alta. Caulis brevissimus. Folia circiter 10–12 cum scapo quoque, eximie disticha, equitantia, linearia, longiora, ad 2 ped. alta, ad 3 lin. lata, æqualiter acutata, planissima, rigida, glaberrima, in marginibus levia et subincrassata, tenuiter sed distincte striata. Scapus foliis æquilongus vel paulo brevior, in tertiâ parte superiore nudus. Spathæ 2 lineari-oblongæ, acutæ, striatæ, scarioso-marginatæ, 5–6-floræ, inferior 16–18 lin. longa, $2\frac{1}{2}$–3 lin. lata, superior 18–22 lin. longa, internodio distincto separata. Bracteæ spathis consimiles, paulo longiores, longe tenuiterque acuminatæ, scariosæ. Perigonii tubus gracillimus, 1 poll. longus, breviter exsertus; lobi exteriores, elliptico-oblongi, albi, purpureo-suffusi, 8 lin. longi, 4 lin. lati, interiores nulli. Filamenta in tubum integrum connata; antheræ 2 lin. longæ. Stylus superne sensim leviterque incrassatus; lobi stigmatici obovato-oblongi, margine papilloso-fimbriati. Capsula inter bracteas sessilis, $\frac{3}{4}$ poll. longa; valvæ styli residuis caudatæ. Semina ellipsoidea, 1 lin. longa, nigra, nitidissima.

Temburungo, alt. 7700 feet (*Haviland*, 1179).

Allied to the preceding species, but much taller and with a somewhat different foliage. I have not seen the slightest trace of the inner row of segments in the perianth. The structure of the spikes, which are few-flowered riphidia, is the same which is typical for a great number of Irideæ, and amongst them for *Sisyrinchium*, to which *Patersonia* approaches indeed closely in more than one respect.

LILIACEÆ.

SMILAX LÆVIS, Wall. Cat. 5116; A. DC. Monogr. i. 56.

At 7800 feet (*Haviland*, 1145).

Distribution: Malaya, in the Peninsula as far as Penang, North Borneo; China.

SMILAX ODORATISSIMA, Blume, Enum. 19.

Dahombang River, alt. 3000 feet (*Haviland*, 1293).

Distribution: Malaya, from Java to the Philippines; on the mainland to Burma and the Sikkim Himalaya.

I include also *S. aspericaulis*, Wall., in this species, as the differential characters indicated by A. De Candolle do not prove trustworthy if tried with the material of *S. aspericaulis* preserved at Kew. From the Philippines I have seen a form with emarginate leaves. It was collected in North Luzon (*Vidal*, 1434).

SMILAX LEUCOPHYLLA, Blume, Enum. 18, A. et C.

At 5500 feet (*Haviland*, 1226).

Distribution: Throughout Malaya, from the Peninsula to the Philippines and the Moluccas; Cochin-China.

DIANELLA ENSIFOLIA, Redouté, Lil. t. 1.

At 8000 feet (*Burbidge*); Maripari Spur, alt. 5500 feet and 7500 feet (*Haviland*, 1156, 1260).

Distribution: Tropical Himalaya from Nepal eastward, Khasia Hills, Munipore, and Burma; Ceylon; Malaya to the Pacific; Mascarenes.

Burbidge's specimen represents the caulescent form with leaves 1 inch broad and glaucous, whilst Haviland's specimens possess leaves not more than 2–3½ lin. broad and a much shortened stem. In no. 1156 (from an elevation of 7500 feet) the leaves are all basal except two very reduced ones on the scape; in the other specimen there are three distinct internodes visible, the middle one measuring 7 lines in length. Different as the habit of both forms may appear at the first glance, it is evident from the rich material which is preserved at Kew that both are only different states of one species. It seems that the young branches, which always begin with a "rosette" of basal leaves, produce flowers sometimes in the first season, but more often in the second, when the stem has grown out and the leaves are separated by internodes from ¼ to 1 inch.

PALMÆ.

Palms are repeatedly mentioned by the travellers, but there is not a single specimen in the Herbarium except an incomplete one of what I take to be a *Pinanga*, collected by Lobb on the lower Tampassuk. Several species are grown near the Dusun houses, according to Mr. Burbidge, who mentions specially *Cocos nucifera*, Linn., *Pinanga* sp., *Areca* sp., and *Oncosperma filamentosum*, Blume. Another species of *Areca* is stated by him to be wild, to measure about 10 feet in height, and to produce clusters of red fruits about 4 feet above the ground. "Rotang palms" seem to be common throughout the jungle of both mountain regions. Mr. Burbidge figured two of them one apparently a true *Calamus* and the other a *Korthalsia*, with the foliage so characteristic of this genus. The latter was observed near Koung.

AROIDEÆ.

Gamogyne Burbidgei, N. E. Brown in Journ. Bot. xx. (1882) 195.

In a ravine near Pakapaka (*Burbidge*).

Distribution: North Borneo (*Burbidge*).

ERIOCAULACEÆ.

Eriocaulon Hookerianum, Stapf, n. sp. Caulis *perbrevis*. Folia densissime congesta, e basi latiore linearia, 1½–3 poll. longa, *basi* 2 *lin.*, *rarius ad* 3 *lin. lata*, brevissime acutata vel obtusa, *rigidula*, erecta vel subfalcatim recurvata, vix pellucida (nisi in statu juvenili vel emarcida), tenuiter fenestrata, nervis circa 15. Scapus 5–7 poll. longus, sulcatus. Capitula 3 lin. dimetiens. Bracteæ *involucrantes* rotundatæ vel late ovato-rotundatæ, scariosæ, *glabræ*, demum ex apice varie laceræ; bracteæ *interiores* late obovato-cuneatæ, obtusissimæ, cæruleo-cinereæ, dorso sub apice albo-pilosæ, 1⅓ lin. longæ. Receptaculum villosum. Flores utriusque sexus mixti. Flos masculus: Perianthium biseriatum 3-merum; segmenta seriei exterioris a dorso compressæ antice libera, cæterum ad ⅓ connata, obovata, albo-pilosa, 1 lin. longa; segmenta seriei interioris exteriore paulo longioris stipitatæ tubuloso-campanulatæ albæ inæqualia, oblonga, sub apice glandulâ nigrâ notata, intermedium ½ lin. longum, lateralibus vix duplo majus. Stamina 6; filamenta alternatim longiora. Ovarii

rudimentum 3-lobum, nigrum. Flos femineus: Perianthium exterius segmentis distinctis spathulato-cuneatis, superne navicularibus, apice pilosis, $1\frac{1}{4}$ lin. longis, interius stipite nudo distans segmentis albis spathulatis dense albo-villosis, glandulâ nigrâ notatum. Ovarium sessile; styli exserti. Semen ellipsoideum vel subglobosum, $\frac{3}{8}$ lin. longum.

Maripari Spur, from 5000 to 5500 feet (*Low, Burbidge*; *Haviland*, 1153); Tembu-rungo, from 7500 to 7700 feet (*Haviland*, 1153 (*bis*), 1204).

Distribution: North Borneo; Tonkin (?).

Closely allied to *Eriocaulon subcaulescens*, Hook. fil., from Ceylon, but differing in the very short stem, the generally broader leaves, which are also more rigid and obtuse, in the darker heads, the less copious indumentum of the bracts and flowers, and the less unequal lobes of the inner male perianth, which does not very much exceed the outer, by which it is enveloped almost entirely. This is also compressed from the back and slit to the base in front, but otherwise connate to $\frac{1}{3}$ at least. The specimens collected on Kinabalu are all very uniform, but those of Balansa from l'Ile Verte, east of the bay of Fi-Tsi-Long in Tonkin (246), have somewhat larger heads, a more copious indumentum, and a longer middle lobe in the inner male perianth, thus approaching *E. subcaulescens*, and I am not quite sure whether it can really be referred to *E. Hookerianum*. On the other hand, a specimen collected by Beccari in Sarawak (2420) agrees perfectly with the Kinabalu plant.

CYPERACEÆ.

Scirpus inundatus, Sprengel, Syst. i. 207.

At 11,000 feet (*Haviland*, 1397).

Distribution: North Borneo; Australia from Queensland to Tasmania; Norfolk Island; New Zealand.

Scirpus Clarkei, Stapf, n. sp. Cæspitosus, $\frac{1}{2}$–2 ped. altus, *gracilis*. Rhizoma breve, dense fibrosum, culmos numerosos, dense fasciculatos, edens. Culmi $\frac{1}{2}$–2 ped. alti, teretes, sulcato-striati, tenues, crassiores, vix, $\frac{1}{4}$ lin. dimetientes, ad 2–4 poll. vaginati. Folia inferiora ad vaginas tenuiter striatas, fuscescentes, arcte culmo adpressas, oblique truncatas, mucrone $\frac{1}{2}$–$1\frac{1}{2}$ lin. longo superatas redacta, *summum* interdum longe vaginans *laminâ subulatâ* $\frac{1}{2}$–1 *poll. longâ*, plus minusve plicatâ, marginibus serrato-denticulatis. Spiculæ *solitariæ*, oblongæ, lineares, 3–4 lin. longæ, pauci- vel ad 8-floræ; bracteæ paucæ (interdum 5), infimæ vacuæ, cæteræ fertiles. Bractea infima a cæteris internodio distincto remota, late rotundata, in mucronem brevem viridem in margine scabrum excurrens, sequentes inter se æquales, ovato-oblongæ, $1\frac{1}{3}$–$1\frac{2}{3}$ lin. longæ, *obtusæ* vel subobtusæ, muticæ, pallide castaneæ, carinatæ, carinâ viridi. Perianthii setæ tenuissimæ, flexuosæ, 1–$1\frac{1}{4}$ lin. longæ, breviter parceque papillosæ, 6 (an semper?). Stamina 3; filamenta linearia, $1\frac{1}{4}$ lin. longa; antheræ vix $\frac{3}{8}$ lin. longæ, in floribus superioribus plus minusve redactæ. Stylus in floribus inferioribus ad $\frac{1}{4}$–$\frac{1}{3}$, in superioribus ultra medium in ramos 3 stigmatosos, filiformes fissus. Caryopsis cinereo-fusca, obovato-oblonga vel oblonga, ad 1 lin. longa, apice subito apiculata, dorso convexa, leviter carinata, facie subplana.

At 11,000 feet (*Haviland*, 1398).

Allied to *Scirpus subcapitatus*, Thw., but distinct by the very slender habit, the more advanced development of the lamina of the leaves, and spikelets always solitary, with rather obtuse bracts. It approaches very closely certain Chinese specimens which probably belong to *S. subcapitatus*, the fruit of which, however, is still unknown, particularly one from the lower Yang-tse-Kiang (*Maries*), and also a specimen collected by Beccari on Mt. Singalan in Sumatra (no. 276). However, the latter is much stouter, and the bracts of the spikelets are longer and more acute. Mr. C. B. Clarke considers it to be also a form of *S. subcapitatus*.

SCHŒNUS APOGON, Rœmer et Schultes, Syst. ii. 77.—Syn. *Chætospora imberbis*, R. Brown, Prodr. 233; *S. Brownii*, Hook. fil. Handb. N. Zeal. Fl. 298; Bentham and F. Mueller, Fl. Austral. vii. 373.

In crevices of rocks from 11,000 to 13,000 feet (*Haviland*, 1395, 1396; *Low* at 9000 feet).

Distribution: From Queensland to Tasmania; North Borneo; Loo-Choo Islands.

SCHŒNUS MELANOSTACHYUS, R. Brown, Prodr. 231.

Maripari Spur, at 5500 feet (*Haviland*, 1407).

Distribution: Queensland to New South Wales; West Australia (?); North Borneo.

CLADIUM BORNEENSE, C. B. Clarke, n. sp. *C.* "*culmis robustioribus, teretibus; foliis subnullis, paniculâ oblongâ, densâ, spiculis composite fasciculatis; pistillo juniore ellipsoideo-trigono, rostro ovoideo-conico, glabro, stylo 3-fido.* Rhizoma repens, 4 mm. in diam., ligneum. Culmi metrales, 3 mm. in diam., nisi basi nudi. Vagina summa 1 dm. longa, in altero latere 1–4 cm. lanceolato-producta. Panicula 6 cm. longa, 2 cm. lata; rami approximati, rigidi, anfractuosim flexuosi, suberecti, minute scabridi; bractea ima vix vaginata, cum $\frac{1}{2}$–$\frac{3}{4}$ parte paniculæ subæquilonga. Spiculæ 6 mm. longæ, fusce brunneæ, sub 5-glumæ. Glumæ undique imbricatæ, ovato-oblongæ, 1-nerviæ, minute scabro-puberulæ; 3 imæ vacuæ, apice obtusæ, subaristellatæ, quarta perfecta, nucifera, cum imis æquilonga, vix aristellata, summa angustior, obtusa, vacua. Setæ 3, minutæ, ovatæ. Stamina 3; antheræ lanceolato-cristatæ. Stylus linearis, glaber; rami 3 lineares."

At 5000 feet (*Low*).

Distribution: North Borneo [plains near Tamparluli, in moist places (*Burbidge*)].

"Species *C. vaginali* proxima, sed inflorescentia fere *Cladii Vautheriæ*; etiam a *C. teretifolio*, R. Br., parum distat."

CLADIUM SAMOENSE, C. B. Clarke, n. sp.—Syn. *Vincentia latifolia*, Nad. Pl. Tahiti, 34 (?), non Kunth. *C.* "*paniculâ laxiusculâ; spiculis atrorubris; glumis minute scabro-puberulis; stylo 3-fido; nuce triquetrâ, in stipite lineari-obconico sustentâ, rostro cum nuce æquilongo, scabro-pilosulo.* Characteres sectionis *Vincentiæ*. Culmus 6 dm. longus. Folia 12 mm. lata. Panicula 2 dm. longa, fere 1 dm. lata; ramuli scabro-pilosuli. Spiculæ 4–5 mm. longæ. Filamenta cum stylis exserta. Nux vix alata; stipes nuce propriâ multo brevior, obpyramidalis."

Maripari Spur, at 5500 feet (*Haviland*, 1406); at 11,500 feet (*Haviland*, 1405).

Distribution: Polynesian Islands (Viti, Samoa, Tahiti).

"In exemplo Bidwellii, planta major, panicula magis evoluta, nux non maturata."

[NOTE.—Mr. Clarke distinguishes a variety "*uniseta*; setâ unicâ, cum $\frac{3}{4}$ parte nucis subæquilongâ, filiformi, levi, rubrâ." The Borneo specimens possess a similar, but pale seta; their nuts, however, are more elongate in all parts.—O. STAPF.]

CAREX RARA, Boott, Trans. Linn. Soc. xx. 139.

At 11,000 feet (*Haviland*, 1393).

Distribution: East Himalaya and Khasia Hills; Ceylon.

A very closely allied species, *C. capillacea*, Boott, is found in the Sikkim and Bhotan Himalaya, in Manchuria, Japan, and in New South Wales.

CAREX FUSIFORMIS, Nees, ex Wight, Contr. 128.

At 11,000 feet (*Haviland*, 1404).

Distribution: Temperate Himalaya, from Sikkim to Kumaon.

CAREX HYPSOPHITA, Miquel, Fl. Ind. Bat. iii. 354.

At 10,000 feet (*Haviland*, 1403).

Distribution: Malaya, from Sumatra to Java.

CAREX FILICINA, Nees, ex Wight, Contr. 123.

At 10,500 feet (*Haviland*, 1402).

Distribution: Himalaya and Khasia Hills; S.W. Deccan and Ceylon; Malaya.

GRAMINEÆ.

ISACHNE KUNTHIANA, Nees, ex Wight & Arnott, Cat. n. 1659.—Syn. *Panicum Kunthianum*, Wight & Arnott ex Steud., Syn. Gram. 96.

At 8000 feet (*Haviland*, 1408).

Distribution: Ceylon and S.W. Deccan; Malaya.

OPLISMENUS COMPOSITUS, Beauv., Agrost. 54.

Dahombang River, at 3000 feet (*Haviland*, 1409).

Distribution: As a weed, widely spread throughout the Tropics.

MISCANTHUS SINENSIS, Andersson in Öfvers. Vet. Akad. Förhand. Stockholm, 1855, p. 166.

At 5000 feet (*Low*).

Distribution: China to Tonkin and to Corea; Loo-Choo Islands and Bonin Isl. to Japan.

AGROSTIS CANINA, Linn. Spec. Plant ed. I. 62.

—— var. BORNEENSIS, Stapf, n. var. Culmi longe ascendentes, ad vel ultra paniculam laxe vaginati. Panicula contracta, 2 poll. longa, atropurpurea, folio summo supe-

rata; rami ramulique fere læves. Glumæ vacuæ subæquales, $1\frac{1}{2}$–$1\frac{3}{4}$ lin. longæ, florens 1 lin. longa, rigidior, ex medio vel paulo supra aristata; arista $1\frac{1}{4}$ lin. longa.

At 13,000 feet (*Haviland*, 1399).

Distribution (of species): Europe, with the exception of the Mediterranean province; Caucasus and N.E. Asia Minor; Southern Siberia to Kashmir and Sikkim: North America from Greenland to the North-eastern States; Aleutian Islands to Sitka; Falkland Islands and Southern Patagonia; New Zealand and Campbell Island.

I have very carefully compared this grass with the numerous varieties of *Agrostis canina*, but I have not been able to identify it exactly with any one of them. It certainly approaches nearest the variety which was originally described as *A. falklandica* by Sir J. Hooker, and a form collected by Colenso in New Zealand (no. 4142), so far as the general habit is concerned. But it has decidedly larger spikelets, with a more rigid flowering glume than the former, whilst the awnless spikelets of the latter are 2 lin. long. The form found in the Sikkim Himalaya deviates more in the habit and in the small awnless flowering glume.

DEYEUXIA EPILEUCA, Stapf, n. sp. (Pl. XX. c. 10–16.) Gramen perenne, cæspitosum, $1\frac{1}{2}$–2 poll. altum. Culmi floriferi atque innovationes intravaginales basi arcte vaginati, illi (demum quidem) a medio vel ultra nudi, hæ minute pubescentes. Foliorum vagina glabra, prominenter striata, ligula obsoleta, lamina linearis plana vel in statu juvenili vel humefacta plicata, $\frac{3}{4}$–$1\frac{1}{2}$ poll. longa, $\frac{1}{2}$–$\frac{3}{4}$ lin. lata, obtusiuscula, in marginibus scabridula, *supra albo-glauca, subtus pallide viridis*, vix glaucescens, præter nervum medium carinatim prominentem nervis utrinque 3–4 plus minusve prominulis percursa. Panicula parva, oblongo-ovata, 3–6 lin. longa, vix 3 lin. lata vel anguste contracta; ramuli breves, pauciflori, stricti, dense hispiduli; pedicelli interdum brevissimi. Spiculæ 1-floræ; *rhachilla glabra ultra florem in setam glabram strictam* $\frac{1}{4}$ *lin. longam producta.* Glumæ vacuæ 2, ovatæ, a latere compressæ, carinatæ, acutæ, in carinâ hispidulæ vel glabratæ, nervis lateralibus abbreviatis, sæpe indistinctis, utrinque 1, rarius 2, superior paulo longior, $\frac{3}{4}$–$\frac{4}{5}$ lin. longa; florens oblique oblonga, 1 lin. vel paulo ultra longa, obtuse subcarinata, lævissima, subcartilaginea, trinervis, nervis lateralibus sub margine paulo inflexo fere ad apicem ductis, sæpe nervulis tenuissimis, utrinque 1, interjectis. Palea æquilonga obtuse subcarinata, lævissima, dorso profunde sulcata. Lodiculæ 2 ad medium connatæ, æquales vel subæquales, ovario paulo breviores. Stamina 3; antheræ vix $\frac{1}{2}$ lin. longæ. Ovarium ovoideum; styli breves, distincti; stigmata plumosa. Caryopsis oblonga, subobliqua, glumâ paleâque inclusa, libera, $\frac{3}{4}$ lin. longa; hilum basale, obliquum.

At 10,5000 feet (*Haviland*, 1401).

This is a very marked species, the affinity of which lies rather with some Australian species than with any others, though it is far from being closely connected. The general habit is like that of dwarf specimens of *D. minor*, Benth., but the glumes are smaller and much less acute, the flowering glume is firmer and awnless, and the rhachis distinctly produced. The spikelets come, perhaps, nearer to those of *D. Gunniana*, Benth., but this is a very delicate and probably annual grass with setaceous leaves.

DESCHAMPSIA FLEXUOSA, Trinius, in Bull. Sc. Acad. Petersb. i. (1836), 66.

—— var. LIGULATA, Stapf, n. var. Folia rigidiora, crassiora; ligulæ foliorum intermediorum 2–4 lin. longæ, albo-scariosæ, tenues, fere ad basin bifidæ.

At 13,000 feet (*Haviland*, 1400).

Distribution (of species): Europe from Scandinavia to the Mediterranean Sea and to the Caucasus; North America from Greenland to Canada and the Northern United States; Falkland Islands and Magellan Strait.

A specimen from Baie Française, in the Falkland Islands, comes nearer to this variety than any other specimen I have seen. The leaves measure over ⅓ lin. in diameter, but their anatomical structure is exactly of the same type as that of the common form with setaceous leaves. The difference is due to the enlargement of the cells, whilst the greater stiffness is caused by the stronger development of the subepidermal layer of sclerenchyma. The awn is straight in the Kinabalu specimens, but they are still young; and the awns of typical *D. flexuosa* may also be found to be so in this state.

SCHIZOSTACHYUM BLUMII, Nees, Agr. Bras. 535 (?).

Tawaran, at 1600 feet (*Haviland*, 1387).

Distribution: Malaya, from Java to Borneo.

The specimen is too imperfect to make the determination perfectly safe. It seems, however, to be certainly identical with specimens collected by Motley near Banjermassin. One of these was named *S. brachycladum* by Munro in MSS.; but he added "very near *S. Blumei*," and then "*S. Blumei* ?," and I cannot distinguish it from the present species. But these specimens, again, are not in a sufficiently perfect condition for settling the question.

DINOCHLOA (?), sp.

Penokok River, 3000 feet (*Haviland*, 1390).

The flowers are too young for description, but the plant has perfectly the appearance of *D. Tjankorreh*, Buese, with the exception that the spikelets are larger and each cluster is supported by a bract of almost equal length.

CONIFERÆ.

DACRYDIUM ELATUM, Wallich, Cat. 6045; Endlicher, Conif. 226.

At 6,600 feet (*Haviland*, 1183).

Distribution: Malaya, from the Peninsula and Sumatra to Borneo; Cambodja.

DACRYDIUM, n. sp., aff. *D. elato*, Wallich.

Small tree with pendulous branchlets, when young; from 8000 to 11,000 feet (*Low*).

A very characteristic species with long pendulous branchlets, with the leaves about ½ in. in diameter. The densely crowded leaves are erect, but slightly curved outwards and ¾ in. long and ½ lin. broad. They are triangular in transverse section, with a distinct keel on the back and a faintly raised middle nerve above, and they terminate with a hard and sharp mucro. The specimens have neither flowers nor fruits.

PHYLLOCLADUS HYPSOPHYLLA, Hooker fil. Ic. Pl 889.

A tree 10–30 feet high at lower elevations, from 8000 to 10,000 feet (*Low*); a shrub from 10,000 to 12,000 feet (*Haviland*, 1092).

Distribution: North Borneo; New Guinea. This species was found also on Lobong Peak, N.E. Borneo, at 4000 feet, by Lobb, and in Sarawak by Beccari (no. 2391, 3220).

PODOCARPUS CUPRESSINA, R. Brown, ex Mirbel in Mém. Mus. Par. xiii. 75.

At 11,000 feet (*Haviland*, 1094).

Distribution: Malaya, from the Peninsula and Sumatra to the Philippines; Hainan; North Burma; New Caledonia and Viti Isl. (?).

The locality where Griffith collected the plant is near the serpentine mines south of the Hoo-Koom Valley, between 1600 and 2600 feet. The New Caledonian specimens are not quite complete and may perhaps belong to another species.

PODOCARPUS NERIIFOLIA, D. Don, in Lamb. Pin. edit. I. p. 122, et 3, p. 74; Hooker fil. Fl. Br. Ind. v. 649.

—— var. BREVIFOLIA, Stapf, n. var. Folia densissima, $\frac{1}{2}$–$1\frac{1}{4}$ poll. longa, 2–3 lin. lata. Amenta mascula solitaria. Fructus ovoideus, 5 lin. longus, receptaculum bracteis anguste ovatis integris suffultum æquans.

From 11,000 to 12,000 feet (*Low*, ♀; *Haviland*, 1093, ♂).

Distribution (of species): Malaya, from the Peninsula and Sumatra to the Philippines; Tropical Himalaya and Khasia Hills; Indo-China; Central China and Japan.

I have not been able exactly to match the present form, which comes nearest to the one described as *Podocarpus polystachya* by R. Brown, and merged by Sir Joseph Hooker in *P. neriifolia*. It is probably an alpine state of *P. polystachya*, with a stunted habit owing to an elevated and exposed locality.

FILICES. (By J. G. BAKER.)

GLEICHENIA CIRCINATA, Swartz, Syn. Fil. 165; Hooker & Baker, Syn. Fil. ed. II. 11.

At 5000 to 6000 feet (*Burbidge*); at 10,500 feet (*Haviland*, 1483).

Distribution: From Australia and New Zealand to Malacca and the Philippines.

CYATHEA HAVILANDII, Baker, n. sp. (37 *). Stipites validi, paleis lanceolatis copiosis brunneis crispatis ad apicem præditi. Lamina oblongo-lanceolata, tripinnatifida, subcoriacea, glabra, bipedalis, 9–12 poll. lata, infra in pinnularum costis dense paleacea; rhachis valida, paleacea; pinnæ sessiles, oblongo-lanceolatæ, inferiores numerosæ, 5–6 poll. longæ, 2 poll. latæ, infimæ haud reductæ; pinnulæ plurimæ confertæ, lanceolatæ, sessiles, inferiores profunde pinnatifidæ, segmentis tertiariis lineari-oblongis, erecto-patentibus; venulæ simplices 4–5-jugæ, erecto-patentes. Sori in pinnularum costis uniseriati. Indusium firmum, cupulatum, persistens, glabrum, ore truncato.

At 10,500 feet (*Haviland*, 1485).

A very distinct species, most resembling in texture and final segments the American *Alsophila pruniata*.

* The numbers attached to the new Ferns indicate their position according to the sequence of species followed in Hooker & Baker, 'Synopsis Filicum.'

CYATHEA POLYPODA, Baker, n. sp. (38). Lamina ampla, subtripinnata, utrinque viridis, glabra, infra paleis copiosis albidis ovatis convexis, præsertim in segmentorum costis, prædita; rhachis nuda, inermis; pinnæ oblongo-lanceolatæ, sesquipedales, 4–5 poll. latæ; pinnulæ lanceolatæ, pinnarum apice excepto distincte petiolatæ, inferiores 2–2½ poll. longæ, 6 lin. latæ, pæne ad costam pinnatæ; segmenta tertiaria oblonga, integra, obtusa, 1½–2 lin. lata; venæ 7–8-jugæ, venulis profunde furcatis. Sori inter segmentorum costam et marginem mediales. Indusium cupulatum, parvum, glabrum.

At 7000 feet (*Haviland*, 1479).

Near *Cyathea integra*, J. Sm., a native of Amboina and the Philippine Islands.

ALSOPHILA LATEBROSA, Hooker, Spec. Fil. i. 37; Hooker & Baker, Syn. Fil. 43.

Thirty feet high, common at 2000 feet (*Low*).

Distribution: Common almost throughout India proper and Malaya to Formosa.

HYMENOPHYLLUM DILATATUM, Swartz, Syn. Fil. 147; Hooker & Baker, Syn. Fil. 62.

From 5000 to 7000 feet (*Burbidge*).

Distribution: From New Zealand and Polynesia to Penang, Tonkin, and the Philippines.

HYMENOPHYLLUM NEESII, Hooker, Spec. Fil. i. 99; Hooker & Baker, Syn. Fil. 76.

Without precise locality (*Low, Burbidge*).

TRICHOMANES DIGITATUM, Swartz, Syn. Fil. 370; Hooker & Baker, Syn. Fil. 76.

Without precise locality (*Burbidge*).

Distribution: Malaya; Polynesia; Mascarenes.

TRICHOMANES PALLIDUM, Blume, Enum. Pl. Jav. 225; Hooker & Baker, Syn. Fil. 80.

Without precise locality (*Burbidge*).

Distribution: Ceylon; Malaya; Queensland; Samoa.

TRICHOMANES FILICULA, Bory, in Duperrey's Voy. Bot. 283; Hooker & Baker, Syn. Fil. 81.

Without precise locality (*Burbidge*).

Distribution: Widely spread throughout the Tropics of the Old World, and in Polynesia.

TRICHOMANES MICROCHILUM, Baker, n. sp. (49). Rhizoma filiforme, late repens. Stipites graciles, nudi, erecti, 1½–2 poll. longi, sursum anguste alati. Lamina oblongo-lanceolata, glabra, decomposita, 3–4 poll. longa; rhachis ad basin anguste alata; pinnæ sessiles, inferiores lanceolatæ, pollicares, basi postice cuneato-truncatæ, infimæ haud reductæ; pinnulæ infimæ deltoideæ, segmentis ultimis erecto-patentibus anguste linearibus uninerviis integris. Sori pauci, terminales, sessiles. Indusium oblongum, ¾ lin. longum, ore labiis 2 minutis ovatis integris erectis membranaceis instructo.

At 7000 feet (*Haviland*, 1478).

Habit and cutting of *Hymenophyllum polyanthos*, Sw., and *H. demissum*, Sw.

TRICHOMANES RIGIDUM, Swartz, Syn. Fil. 144; Hooker & Baker, Syn. Fil. 86.
From 5000 to 7000 feet (*Burbidge*).
Distribution: Throughout the Tropics of both hemispheres.

TRICHOMANES APIIFOLIUM, Presl, Hymenoph. 16 et 44; Hooker & Baker, Syn. Fil. 86.
At 6000 feet, on *Casuarina* trees (*Burbidge*).
Distribution: Malaya; Philippines; Polynesia; Norfolk Island.

TRICHOMANES MAXIMUM, Blume, Enum. Fil. Jav. 228; Hooker & Baker, Syn. Fil. 86.
From 5000 to 6000 feet (*Low, Burbidge*).
Distribution: Malaya to North Australia and Polynesia.

TRICHOMANES PLUMA, Hooker, Ic. Pl. x. 997.
From 5000 to 6000 feet (*Burbidge*).
Distribution: North Borneo; Perak.

TRICHOMANES TRICHOPHYLLUM, Moore, Gard. Chron. 1862, 45; Hooker & Baker, Syn. Fil. 466.
Without precise locality (*Low*); from 5000 to 6000 feet (*Burbidge*).
Distribution: Malaya; New Guinea; New Caledonia.

DAVALLIA ALPINA, Blume, Enum. Pl. Jav. 231; Hooker & Baker, Syn. Fil. 89.
At 10,500 feet (*Haviland*, 1491).
Distribution: Malaya; Polynesia.

DAVALLIA CONTIGUA, Swartz, Syn. Fil. 130; Hooker & Baker, Syn. Fil. 94.
At 10,500 feet (*Haviland*, 1484).
Distribution: Ceylon; Malaya; Polynesia.

DAVALLIA VEITCHII, Baker, Journ. Bot. viii. (1879) 39.
From 6000 to 7000 feet (*Burbidge*).
An endemic species.

DAVALLIA CILIATA, Hooker, Spec. Fil. i. 184, t. 60 A.; Hooker & Baker, Syn. Fil. 98.
At Koung (*Burbidge*).
Distribution: Philippines.

DAVALLIA TENUIFOLIA, Swartz, Syn. Fil. 130; Hooker & Baker, Syn. Fil. 102.
At Koung (*Burbidge*).
Distribution: Common in Tropical Asia and in Polynesia; Japan; Mascarenes.

LINDSAYA JAMESONIOIDES, Baker, Journ. Bot. viii. (1879) 39.
At 5500 feet (*Haviland*, 1495); at 9000 feet (*Burbidge*).
An endemic species.

LINDSAYA FLABELLULATA, Dryander, Trans. Linn. Soc. iii. 41, t. 8. f. 2; Hooker & Baker, Syn. Fil. 107.

On the Dahombang River (*Burbidge*).
Distribution: Malaya to South China, North India and Ceylon, and to Australia.

PTERIS INCISA, Thunberg, Prodr. Fl. Cap. 171; Hooker & Baker, Syn. Fil. 172.
At 7000 feet (*Haviland*, 1492).
Distribution: Through the Tropics of both hemispheres.

ASPLENIUM SQUAMULATUM, Blume, Enum. Pl. Jav. 174; Hooker & Baker, Syn. Fil. 192.
At Koung (*Burbidge*).
Distribution: Malaya and Philippines.

ASPLENIUM BORNEENSE, Hooker, Spec. Fil. iii. 136, t. 186; Hooker & Baker, Syn. Fil. 203.
On the Dahombang River, at 2000 feet (*Low*); at 3200 feet (*Haviland*, 1477).
Distribution: North Borneo; Perak.

ASPLENIUM LASERPITIIFOLIUM, Lamarck, Encycl. Bot. ii. 310; Hooker & Baker, Syn. Fil. 215.
From 2000 to 3200 feet (*Haviland*).
Distribution: From Polynesia and North Australia to Chusan and the Bonin Islands; Assam.

ASPLENIUM DICHOTOMUM, Hooker, Spec. Fil. iii. 210; Hooker & Baker, Syn. Fil. 221.
Without precise locality (*Low*); in shady jungle near Kiau (*Burbidge*).
Distribution: North Borneo.

ASPLENIUM BISERIALE, Baker, n. sp. (209); (§ *Diplazium*). Caudex breviter repens. Stipites erecti, $1\frac{1}{2}$–2 poll. longi, ad apicem paleis lanceolatis squarrosis brunneis vestiti. Lamina oblongo-lanceolata, simpliciter pinnata, glabra, utrinque viridis, 4–6 poll. longa, $1\frac{1}{2}$–2 poll. lata, rhachi paleis parvis vestitâ; pinnæ multijugæ, sessiles, lanceolatæ, superiores integræ, inferiores 1 poll. longæ, 2 lin. latæ, profunde crenatæ, basi inæquales, postice reductæ; venæ obscuræ, erecto-patentes. Sori costulares, in utroque latere costæ uniseriati, lineari-oblongi, sæpe diplazioidei. Indusium latum, membranaceum, glabrum, persistens.
At 3000 feet (*Haviland*, 1475).
The specimen resembles a much reduced form of the cosmopolitan *A. sylvaticum*, Presl.

ASPLENIUM LATIFOLIUM, D. Don, Prodr. Fl. Nepal. 8; Hooker & Baker, Syn. Fil. 239.
In shady jungle near Kiau (*Burbidge*).
Distribution: Ceylon and Nilgherries; Sumatra, Borneo, and Philippines; South China.

DIDYMOCHLÆNA LUNULATA, Desv. Prodr. 282; Hooker & Baker, Syn. Fil. 248.
At 3500 feet (*Burbidge*).
Distribution: Throughout the Tropics of both hemispheres.

NEPHRODIUM GYMNOPODUM, Baker, n. sp. (17); (§ *Lastrea*). Stipites graciles, nudi, nitidi, fusci, 4–5 poll. longi. Lamina oblonga lanceolata, bipinnata, subcoriacea, glabra,

semipedalis, rhachi utrinque pubescente, haud paleaceâ; pinnæ liberæ, circiter 20-jugæ, infimæ maximæ, deflexæ, sessiles, lanceolatæ, 15–18 lin. longæ, 4 lin. latæ. ad costam pinnatæ, segmentis lineari-oblongis, integris, ¾ lin. latis; venæ remotæ, erecto-patentes, simplices. Sori ad segmentorum basin solitarii, mediales. Indusium parvum, reniforme.

At 10,500 feet (*Haviland*, 1486).

Belongs to the group of *N. patens*, Desv., near *N. chrysolobum*, Fée.

POLYPODIUM HAVILANDII, Baker, n. sp. (107*); (§ *Grammitis*). Caules cæspitosi, graciles, subpollicares, pilis subtilibus, mollibus, patentibus tenuiter vestiti. Lamina simplex, lanceolata, subcoriacea, utrinque pubescens, 2–3 poll. longa, medio 3 lin. lata, ad basin et apicem sensim attenuata, margine obscure crenato; venæ obscuræ furcatæ. Sori oblongi, obliqui, uniseriati, laxe dispositi, ad costam contigui.

At 10,500 feet (*Haviland*, 1488).

POLYPODIUM CUCULLATUM, Nees et Blume, in Nov. Act. Cæs. Leop.-Car. Nat. Cur. ii. 121, t. 126; Hooker & Baker, Syn. Fil. 324.

Without precise locality (*Low*); at 10,500 feet (*Haviland*, 1482).

Distribution: Ceylon; Malaya, Philippines and New Guinea; Polynesia.

POLYPODIUM BLECHNOIDES, Hooker, Sp. Fil. iv. 180; Hooker & Baker, Syn. Fil. 331.

At 10,500 feet (*Haviland*, 1487).

Distribution: Polynesia; Queensland.

POLYPODIUM CLAVIFER, Hooker, Sp. Fil. iv. 176; Hooker & Baker, Syn. Fil. 334.

Without precise locality (*Low*).

Distribution: Borneo; New Guinea.

POLYPODIUM TAXODIOIDES, Baker, Journ. Bot. viii. (1879), p. 42.

On wet rocks on torrents (*Burbidge*).

An endemic species.

POLYPODIUM STENOPHYLLUM, Blume, Enum. Pl. Jav. 124; Hooker & Baker, Syn. Fil. 354.

At 10,500 feet (*Haviland*, 1489).

Distribution: Malaya and Philippines.

POLYPODIUM SORIDENS, Hooker, Spec. Fil. v. 61, t. 283, B; Hooker & Baker, Syn. Fil. 355.

At 8000 feet (*Haviland*, 1493).

Distribution: Borneo.

POLYPODIUM LACINIATUM, Blume, Enum. Pl. Jav. 131; Hooker & Baker, Syn. Fil. 365.

At 10,500 feet (*Haviland*, 1490).

Distribution: Malaya.

POLYPODIUM COSTULATUM, Baker, Journ. Bot. 1880, 215.—Syn. *Acrostichum costulatum*, Cesati, Fil. Becc. Polyn. 8.
On Dahombang River (*Haviland*, 1474).
Distribution: Malaya; New Guinea.

GYMNOGRAMME AVENIA, Baker, in Hook. & Baker, Syn. Fil. 388.
On rocks near Koung (*Burbidge*).
Distribution: Malaya to New Guinea.

VITTARIA SULCATA, Kuhn, Linnæa, xxxvi. 68; Hooker & Baker, Syn. Fil. 518.
At 10,500 feet (*Haviland*, 1481).
Distribution: Ceylon; Perak; Sarawak; New Guinea; Society Islands.

ACROSTICHUM BICUSPE, Hooker, Sp. Fil. v. 271; Hooker & Baker, Syn. Fil. 421.
From 4000 to 8000 feet (*Burbidge*).
Distribution: Malaya to Formosa and the Loo-Choo Archipelago; New Guinea.

SCHIZÆA MALACCANA, Baker, in Hooker & Baker, Syn. Fil. 428.
At 5000 feet (*Burbidge*).
Distribution: Malaya and Philippines

ANGIOPTERIS EVECTA, Hoffm. in Comm. Goett. xii. p. 29, t. 5; Hooker & Baker, Syn. Fil. 440.
On river-banks in sandstone hills, at 2000 feet (*Low*).
Distribution: From Polynesia and Queensland to Japan, the Himalaya, Ceylon, and Madagascar.

LYCOPODIACEÆ.

(By J. G. BAKER.)

LYCOPODIUM CEYLANICUM, Spring, Mon. i. 37.
At 11,000 feet (*Haviland*, 1410).
Distribution: Ceylon; Borneo.

LYCOPODIUM SERRATUM, Thunberg, Fl. Jap. 341, t. 38.
At 4000 feet (*Haviland*, 1416).
Distribution: From India to Japan and Polynesia; Mexico; Bourbon (?).

LYCOPODIUM SELAGO, Linn. Spec. Plant. ed. II. 1565.
At 11,000 feet (*Haviland*, 1411).
Distribution: Arctic and temperate zones of both hemispheres; New Zealand, Australia, Antarctic America; East Himalaya.

LYCOPODIUM WIGHTIANUM, Wallich, Cat. n. 2184.
At 11,000 feet (*Haviland*, 1412).
Distribution: Nilgherries and Ceylon; Java, Borneo.

LYCOPODIUM CLAVATUM, Linn. Spec. Plant. ed. II. 1564.
At 11,000 feet (*Haviland*, 1413).
Distribution: Cosmopolitan.

LYCOPODIUM CASUARINOIDES, Spring, Mon. i. 94.
At 6000 feet (*Burbidge*); at "high altitudes" (*Low*); at 8700 feet (*Haviland*, 1414).
Distribution: Malaya to Philippines, and to the East Himalaya and China.
"The indurations on the stem are hard enough to scratch the hands whilst travelling, and the trailing stem will, like a rotan, catch the foot" (*Haviland*).

LYCOPODIUM VOLUBILE, Forster, Prodr. 86.
At 8000 feet (*Low*).
Distribution: From Polynesia, New Zealand and North Australia, over Malaya to Penang and Borneo.

SELAGINELLACEÆ.

(By J. G. BAKER.)

SELAGINELLA CAULESCENS, Spring, Mon. ii. 158.
On Dahombang River, at 3000 feet (*Haviland*, 1415); common on rocks along the streams (*Burbidge*).
Distribution: Malaya to New Guinea and Philippines, India to China and Japan.

SELAGINELLA WILLDENOWII, Baker, in Gard. Chron. 1867, 950.
From 4 to 6 feet high, near Kiau (*Burbidge*).
Distribution: Malaya; East Himalaya; Cochin-China.

EQUISETACEÆ.

(By J. G. BAKER.)

EQUISETUM DEBILE, Roxburgh, in Vaucher, Mon. 387.
On the banks of the Kadamaian River below Kiau, from 2000 to 2500 feet (*Low*; *Haviland*, 1353).
Distribution: Tropical Asia to Fiji Islands.

MUSCINEÆ.

(By W. MITTEN, A.L.S., and C. H. WRIGHT, F.R.M.S.)

DICRANUM ASSIMILE, Hampe, Icon. Musc. t. 24.
At 6000 feet (*Haviland*, 1428; *Low*).
Distribution: Java, Sumatra, Perak, Sikkim.

DICRANUM, sp. affine *D. undulato*, Turn.
At 11,500 feet (*Haviland*, 1424).

CAMPYLOPUS EXASPERATUS, Brid. Bry. Univ. i. 473.
At 9000 feet (*Low*); Penokok, at 3200 feet (*Haviland*, 1421).
Distribution: Java; Sumatra; Sandwich Isl.

EUCAMPTODON EDENTULUS, Jaeg. Adum. i. 148, var. ANGUSTUS, C. H. Wright, n. var.
Ab *E. edentulo* differt foliis angustioribus, enerviis. Cellulæ apicales cæteris similes, non ovales aut laxiores ut in *E. macrocalyci*, A. Br. (*Holomitrium enerve*, Dozy & Molkenb.).
Maripari, at 5000 feet (*Haviland*, 1420).
Distribution (of species): Ceylon, Borneo.

LEUCOBRYUM SANCTUM, Hampe, in Linnæa, xvii. 316.
Without precise locality (*Burbidge*).
Distribution: Japan; Malacca; Java; Fiji; Samoa.

LEUCOPHANES SQUARROSUM, Brid. Bry. Univ. i. 764.
At 6000 feet (*Burbidge*).
Distribution: Philippines.

SCHISTOMITRIUM LOWII, Mitt. in Journ. Linn. Soc. xxii. 302.
Without precise locality (*Low*).

SYRRHOPODON INVOLUTUS, Schwägr. Suppl. ii. pt. 1, 117, t. 132.
Without precise locality (*Burbidge*).
Distribution: Malacca; Singapore; Moluccas; Samoa.

SYRRHOPODON RUFESCENS, Hook. & Grev. in Brewster's Edinb. Journ. of Sci. iii. 227.
Without precise locality (*Burbidge*).
Distribution: India; Singapore; Penang.

SYRRHOPODON ALBOVAGINATUS, Schwägr. Suppl. ii. pt. 1, 112, t. 131.
Without precise locality (*Burbidge*).
Distribution: Moluccas; Fiji; Admiralty Isl.; Samoa.

RHACOMITRIUM JAVANICUM, Dozy & Molkenb. in Zollinger, Syst. Verzeich. p. 32.
At 11,500 feet (*Haviland*, 1423).
Distribution: Java; Japan.

SCHLOTHEIMIA SPLENDIDA, Mitt., n. sp. Caules repentes cum ramis simplicibus ramificatisve in cæspitem aggregati; rami fructiferi pollicares, humefacti cum foliis $2\frac{1}{2}$ lin. crassi. Folia ramea humefacta squarrosa, exsiccata laxe adpressa, oblongo-lanceolata, supra medium semitorta, subcymbiformiter excavata, $1\frac{1}{2}$ lin. longa, ad $\frac{3}{4}$ lin. lata, apice acuta obtusave, basi contracta, margine integerrimo subflexuoso, lævia, subnitida, nervo angusto rufo in pilum $\frac{1}{3}$ lin. longum flexuosum lævem

excurrente, cellulis inferne elongatis, apicem versus sensim abbreviatis, in lineis a nervo oblique-ascendentibus dispositis; folia perichætialia erecta, quam ramea angustiora et duplo longiora, pilis longis erectis setæ medium fere attingentibus. Theca in setâ gracili 5 lin. longâ, cylindrica, collo sensim attenuato $\frac{1}{5}$ lin. longo, operculo basi cupulato, subulatim angustato, sporangio æquilongo, $\frac{2}{5}$ lin. longo, peristomii exterioris dentibus angustis, exsiccando revolutis, humefactis in conum conniventibus, peristomii interioris ciliis paulo quam peristomii exteriores dentes longioribus erectis; calyptra thecam totam obtegens, basi laciniata, pilis brevibus adpressis aspersa.

Maripari, at 5000 feet (*Haviland*, 1419); without precise locality (*Low*, *Burbidge*).

Remarkable from its thick branches, with leaves not undulated, the cells everywhere distinct and smooth, and its minutely pilose calyptra. *S. Wallisii*, C. Müller, Linnæa, 1870, p. 173, as described, appears to be very near; but its calyptra is said to be "dentibus asperis robustis scabra," and there are some other differences.

SCHLOTHEIMA RUBIGINOSA, C. H. Wright, n. sp. Folia ligulata, obtusa vel emarginata, non pilosa, in medio profunde uniplicata. Rhizoma repens, necnon apice radicans. Rami erecti, 1 poll. alti, simplices, rarius ramosi. Folia imbricata, ligulata, obtusa, medio longitudinaliter profunde uniplicata; costa in plicæ fundo apice leviter excurrens; cellulæ inferiores oblongæ, leptodermaticæ, superiores in seriebus angulo 45° costæ regulariter dispositæ. Costa foliorum perichætialium in pilum laminâ duplo longiorem producta. Fructus in apice ramorum. Seta $\frac{1}{4}$ poll. longa; theca cylindrica, basi acuta: dentes peristomii 16, in medio striatis. Calyptra capsulâ longior, cylindrica, basi 4-fida, lævis.

At 10,500 feet (*Haviland*, 1418).

The aspect of this species is very similar to that of *Schlotheimia splendida*, Mitt., but the leaves are totally different. Those of *S. splendida* are acute and have the nerve produced into a long pilum, while those of this species are obtuse or even emarginate, with the nerve excurrent as a small tooth. The plication of the leaf forms a single pouch-like fold, commencing a short distance below the apex and continuing nearly to the base of the leaf; along its base runs the nerve, which is minutely toothed along the back. When viewed from the dorsal side, this plication resembles the dorsal fin of certain fishes.

MACROMITRIUM CUSPIDATUM, Hampe, Icon. Musc. t. 20.

At 11,000 feet (*Haviland*, 1417).

Distribution: Java; Sumatra.

BRYUM PACHYPOMA, Mont. in Ann. Sc. Nat. ser. 3, iv. 104 (1845).

Without precise locality (*Burbidge*).

Distribution: Java.

MNIUM ROSTRATUM, Schwägr. Suppl. i. pt. 2, 136, t. 79.

At 5000 feet (*Haviland*).

Distribution: Cosmopolitan.

RHIZOGONIUM DISTICHUM, Brid. Bry. Univ. ii. 665.
Without precise locality (*Burbidge*).
Burbidge's specimens consist of a few barren stems which appear identical with New Zealand specimens.

RHIZOGONIUM SPINIFORME, Bruch, in Flora, 1846, p. 134.
Without precise locality (*Burbidge*).
Distribution: South tropical and subtropical zones; also Japan and West Indies.

DAWSONIA SUPERBA, Grev. in Ann. & Mag. Nat. Hist. xix. (1847), 226, t. 12.
Without precise locality (*Burbidge*).
Distribution: Australia; Tasmania; New Zealand.

POGONATUM MACROPHYLLUM, Dozy et Molkenb., Bry. Jav. i. 45, t. 35.
At 6000 feet (*Low, Burbidge*).
Distribution: Java, Sumatra.

RHACELOPUS ACAULIS, Mitt., n. sp. Caulis brevissimus. Folia erecta, a basi dilatatâ contracta, ligulata, apice acuta acutatave, integerrima, cellulis superioribus subrotundis, inferioribus oblongis, perichætialia longiora obtusiuscula, apice paucidentata, omnia nervo satis valido percursa. Seta pollicaris, fusco-rubra, papillis asperrima. Theca oblonga, demum inclinata, lævis, infra os contracta, operculo rostrato. Calyptra, indumento pallido, thecam totam tegens.
With old and young fruit (*Burbidge*).
Size that of *R. pilifer* (Dozy et Molkenb., Bry. Jav. i. 37), but foliage entirely different.

HARRISONIA ALPINA, C. H. Wright, n. sp. *H. Humboldtiæ*, Spreng., affinis, sed folio apice non in pilum producto, capsulâ lævi non sulcatâ. Cæspitosa, brunnea. Caulis pinnatim ramosus. Folia dense imbricata, panduriformia, basi et marginibus rubris, apice acuminata, subsquarrosa, cellulis vermicularibus, dense aggregatis, marginalibus elongatis, rubris, translucentibus, alaribus oblongis, rubido-brunneis; folia perichætialia oblongo-acuminata, apice hyalina; cellulis elongatis, poris connexis, alaribus quadratis. Seta 6 lin. longa, recta; theca ovalis, lævis, gymnostoma. Sporæ magnæ, muricatæ.
On wet rocks, at 11,500 feet (*Haviland*, 1425).

SEMATOPHYLLUM PANDURIFORME, C. H. Wright, n. sp. *S. convoluto*, Jaeg., affine, sed differt staturâ majore, magis ramosa, foliis sub apice contractis, argute serratis. Rhizoma repens. Rami erecti, plus minusve pinnatim ramosi. Folia subpatentia, elongato-panduriformia, 2 lin. longa, margine argute serrato, ex seriebus 3–5 cellularum elongatarum pachydermaticarum composito, cellulis centralibus minoribus, quam marginalia minus crassis, poris communicantibus ut in *Dicrano* (sect. *Eudicrano*); folia perichætialia 3 lin. longa, late lanceolata, apice in pilum longum dentatum producta, cellulis elongatis, poris connexis, marginalibus consimilibus. Seta 2-3 poll. longa, rubra, lævis; theca inclinata, ovata, 2 lin. longa; peristomium

exterius ex dentibus 16 transversatim striatis, interius ex dentibus 16 dilute flavis basi coalitis compositum. Sporæ globosæ, dilute flavæ.

At 6500 feet (*Haviland*, 1426).

TAXITHELIUM DUBYANUM, Mitt. *Hypnum Dubyanum*, C. Müller, Syn. Musc. ii. 241; Dozy & Molkenb. Bry. Jav. ii. 182, t. 280.

At 5000 feet (*Haviland*, 1431; *Burbidge*).

Distribution: Java, Amboina.

MNIODENDRON MICROLOMA, Mitt., n. sp. Stipes humilis, erectus, pollicaris, rufo-tomentosus, apice ramis brevibus, simplicibus, patulis, in comam rotundatam dispositis, innovatione conformi continuus, interdum iterum iterumque prolifer. Folia stipitis laxa, squarrosa, a basi deltoideâ subulata, apice denticulata, nervo ad apicem percursa; folia ramea densa, undique patentia, ovato-lanceolata, subulatim attenuata, rigidula, e viridi fuscescentia, in dorso et in marginibus denticulata, nervo excurrente, cellulis interioribus angustissimis, marginalibus minutis, rotundatis, limbum indistinctum formantibus; folia perichætialia a basi ovatâ plicatâ subulata, apice remote denticulata, nervo longe excurrente. Theca in setâ 1½ poll. longâ rubrâ horizontalis, cylindrica, subarcuata, 3 lin. longa, exsiccando striata, collo distincto, operculo magno longirostri, peristomii dentibus apice angustissime attenuatis.

At 6000 feet (*Burbidge*).

Very similar to the *Isothecium marginatum*, Hook. fil. & Wils., figured in the 'Flora of New Zealand,' but smaller in all its parts. *M. Korthalsii*, Bry. Jav. t. 236, appears considerably different in habit, and its leaves have a thickened margin.

MNIODENDRON KORTHALSII, V. d. Bosch et Lac. in Dozy & Molkenb. Bry. Jav. ii. 139, t. 236.

At 5000 feet (*Haviland*, 1430).

Distribution: Java; Sumatra; Aneitum.

MNIODENDRON DIVARICATUM, Lindb. in Öfvers. Kongl. Vet. Akad. Förh. (Stockholm) xviii. 375 (1861).

Without precise locality (*Low*).

Distribution: Java; Sumatra; Malacca.

HYPNODENDRON REINWARDTI, Dozy & Molkenb. Bry. Jav. ii. 135, t. 233.

At 6000 feet (*Haviland*, 1429).

Distribution: Java; Celebes.

HYPNODENDRON BREVIFOLIUM, Mitt., n. sp. Stipes pollicaris, basi radiculosus, sparse foliatus, ramis pluribus simplicibus vel ramificatis in comam tabuliformem rotundatam 1 poll. latam dispositis. Folia stipitis adpressa, subdeltoideo-ovata, in margine serrulata, ad medium usque nervo tenui percursa; folia ramea lateraliter

compressa, patentia, exsiccando parum mutata, ovato-lanceolata, in margine serrata, nitida, nervo sub apice evanido, cellulis angustissimis elongatis. Perichætia plura aggregata, foliis subulatis remote denticulatis.

Without precise locality (*Burbidge*).

In habit more like a small *Mniodendron comosum*, Lindb., but with shining leaves.

Rhacopilum spectabile, Reinw. & Hornsch. in Nov. Act. Cæs. Leop.-Car. Nat. Cur. xiv. pt. 2, 721, t. 40, fig. c.

At 6000 feet (*Burbidge; Haviland*, 1427).

Distribution: Java; Sumatra; Philippines.

Acanthodium trismegistum, Mitt.—Syn. *Hypnum trismegistum*, Mont. in Lond. Journ. Bot. 1844, p. 633; *Hypnum lancifolium*, C. Müll. Syn. Musc. ii. 497; Dozy & Molkenb. Bry. Jav. ii. 141, t. 239; *Neckera lancifolia*, Harv. in Hook. Ic. Pl. t. 21. fig. 5.

Without precise locality (*Burbidge*).

As in other species of this group, the setæ are three inches in height.

Acanthodium lancifolium, Mitt., in Harvey's specimens has complanate panduriform foliage, the apices wide, very unlike Montagne's species. Another species, as it appears to be, was found in Moulmein by the Rev. D. Parish. There are also a number of Indian mosses which appear to belong to the same group; they are *Hypnum tanytrichum*, Mont., *Stereodon psilurus*, Mitt., *S. surcularis*, Mitt., *S. pilosulus*, Mitt., and *S. penicillatus*, Mitt., as well as *Hypnum papillatum*, Harv. *H. calderense*, Sulliv. in U.S. Expl. Exp. t. xv., may be a state of *A. rigidum*, Mitt., and similar specimens have been collected in Palawan, in the Isle of Pines, and in Samoa. *Hypnum extenuatum*, Brid., from Australia and New Zealand, belongs to this group.

HEPATICÆ.

The following Hepaticæ were found growing with the above-mentioned Mosses, but several in insufficient quantity for specific determination. The numbers affixed to them correspond with those of the Mosses amongst which they were found.

Gottschea, sp.

At 6000 feet (*Haviland*, 1429).

Plagiochila tenuis, Lindenb. Mon. Plagioc. 50.

The fragments found appear to belong to this species, which was previously known from the West Indies, Sandwich Islands, and Nepal.

At 6000 feet (*Haviland*, 1429).

Odontoschisma Sphagni, Dum. Rev. Jung. 19.—Syn. *Sphagnocœtis communis*, Nees.

This common European species was found at an elevation of 11,500 feet. (*Haviland*, 1425).

CHILOSCYPHUS ASELLIFORMIS, Nees, Hepat. Jav. 26.
Maripari Spur, at 5000 feet (*Haviland*, 1419).
Distribution: Java.

SACCOGYNA MURICELLA, Mitt.—Syn. *Chiloscyphus muricellus*, De Not. Epatiche di Borneo, 24, t. 16.
Without precise locality (*Burbidge*).
Distribution: Borneo.

SCAPANIA LEPIDA, Mitt. in Journ. Linn. Soc. v. 101.
Without precise locality (*Burbidge*).
Distribution: Ceylon.

LEPIDOZIA HOLORHIZA, Nees, in Gott. Syn. Hepat. 210.
Without precise locality (*Burbidge*).
Distribution: Java.

LEPIDOZIA CLADORHIZA, Nees, in Gott. Syn. Hepat. 210.
Without precise locality (*Burbidge*).
Distribution: Java

LEPIDOZIA SUBINTEGRA, Lindenb. in Gott. Syn. Hepat. 201.
Without precise locality (*Burbidge*).
Distribution: Java.

LEPIDOZIA TRICHODES, Nees, in Gott. Syn. Hepat. 203.
Without precise locality (*Burbidge*).
Distribution: Java; Bolivia.

LEPIDOZIA WALLICHIANA, Lindenb. et Gott. Syn. Hepat. 204.
At 6000 feet (*Haviland*, 1428); without precise locality (*Burbidge*).
Distribution: Nepal.

MASTIGOBRYUM, sp.
At 6000 feet (*Haviland*, 1427).

TRICHOCOLEA TOMENTELLA, Nees, var. PLUMA, Nees, in Gott. Syn. Hepat. 237.
At 6000 feet (*Haviland*, 1428); without precise locality (*Burbidge*).

PHRAGMICOMA, sp.
At 5000 feet (*Haviland*, 1431).

EXPLANATION OF THE PLATES.

PLATE XI.

A. *Decaspermum Vitis-Idæa* :—1. Branch (nat. size). 2. Flower (×2). 3. Young fruit (×4). 4. Flower, vertical section (×8). 5. Petal (×4). 6. Stamen (×20). 7. Ovary, transverse section (×20). 8. Seed (×20). 9. Seed, longitudinal section (×20).

B. *Eugenia kinabaluensis* :—10. Branch (nat. size). 11. Flower, vertical section (×5). 12. Petal (×5).

C. *Eugenia ampullaria* :—13. Fruiting branch (nat. size).

D. *Tristania elliptica* :—14. Branch (nat. size). 15. Flower (×3). 16. Flower, vertical section (×6).

PLATE XII.

A. *Hedyotis protrusa* :—1. Branch (nat. size). 2. Flower (×4). 3. Fruit; the anterior calyx-lobe is taken off to show the protruding capsule (×6).

B. *Hedyotis pulchella* :—4. Branch (nat. size). 5. Flower (×3). 6. Fruit (×3).

C. *Hedyotis macrostegia* :—7. Branch (nat. size). 8. Flower, with supporting bracts (×3). 9. Ovary and calyx, the front lobes taken off (×3).

D. *Argostemma gracile* :—10. Plant (nat. size). 11. Corolla (×2). 12. Calyx (×2).

PLATE XIII.

A. *Streblosa urticina* :—1. Branch (nat. size). 2. Branch of inflorescence (×6). 3. Flower-bud (×20). 4. Young corolla, cut open (×20). 5. Mature stamens (×40). 6. Very young fruit, vertical section (×20). 7. Style (×20). 8. Ripe fruit (×8). 9. Fruit, vertical section (×8). 10. Fruit, transverse section (×8).

B. *Psychotria densifolia* :—11. Branch (nat. size). 12. Flower (×8). 13. Pyrene, transverse section (×4).

PLATE XIV.

A. *Diplycosia pinifolia* :—1. Branch (nat. size). 2. Flower-bud (×5). 3. Ovary, with disc (×15).

B. *Diplycosia kinabaluensis* :—4. Branch with adult leaves (nat. size). 5. Flowering branch (nat. size). 6. Flower (×2).

C. *Diplycosia pendula* :—7. Branch with young fruits (nat. size).

D. *Diplycosia rufa* :—8. Branch, one leaf turned, seen from the back (nat. size). 9. Corolla (×2).

E. *Diplycosia chrysothrix* :—10. Branch (nat. size). 11. Flower (×2). 12. Calyx and ovary, vertical section (×2). 13. Stamen (×4). 14. Ovary, with disc (×2).

PLATE XV.

A. *Rhododendron lacteum* :—1. Branch (nat. size). 2. Ovary (×2).

B. *Rhododendron cuneifolium* :—3. Branch (nat. size).

C. *Gaultheria borneensis* :—4. Branch (nat. size). 5. Flower, vertical section (×4). 6. Stamen (×12).

D. *Vaccinium cordifolium* :—7. Branch (nat. size). 8. Flower (×2·5). 9. Calyx and ovary, vertical section (×2). 10. Stamen (×6). 11. Ovary, transverse section (×3).

PLATE XVI.

A. *Havilandia borneensis* :—1. Branch (nat. size). 2. Leaf (×3). 3. Flower (×6). 4. Diagram showing the prefloration of the corolla-lobes. 5. Corolla and ovary (×6). 6. Calyx, final state (×3). 7. Ovary (×12). 8. Nutlet (×6). 9. Nutlet, transverse section (×6).

B. *Euphrasia borneensis*:—10. Flowering plant (nat. size). 11. Flower (×3). 12. Calyx (×4). 13. Calyx with ovary (×3). 14. Leaf (×5). 15. Capsule (×5). 16. Seed (magnified).

C. *Cyrtandra Clarkei*:—17. Branch (nat. size). 18. Corolla (nat. size). 19. Calyx, enclosed by the connate bracts (nat. size).

Plate XVII.

Scyphostegia borneensis:—1. Branch with remainder of an inflorescence (nat. size). 2. Inflorescence (nat. size). 3. Flower with funnel-shaped bracts and a young accessory bud (×4). 4. Flower, vertical section (×4). 5. Flower-bud (×4). 6. Diagram showing the position of the perianth-lobes. 7. Half-mature carpel with scales at the base (×5). 8. Very young carpel (×30). 9. Upper end of carpel, vertical section (×10). 10. The same, seen from the front (×10). 11. Ripe fruit (nat. size). 12. Part of the ripe fruit, carpels with their scaly involucres at the base and a portion of the receptacle behind them (×2·5). 13. Ripe carpel, vertical section (×10). 14. Embryo (×10).

Plate XVIII.

A. *Quercus Havilandii*:—1. Branch (nat. size). 2. Female flower (×4). 3. Segment of the perianth with a stamen in front (×5). 4. Female flower, vertical section (×4).

B. *Ficus setiflora*:—5. Fruiting branch (nat. size). 6. Receptacle, vertical section (×2). 7. Achenium with perianth (×15). 8. Perianth, segment seen from within (×30).

C. *Loranthus centiflorus*:—9. Branch (nat. size). 10. Flower (×2).

Plate XIX.

A. *Elatostemma bulbothrix*:—1. Branch (nat. size). 2. Young fruit with supporting bracts (×8). 3. Diagram of female flower, showing the arrangement of the bracts and staminodes. 4. Staminodes (×20).

B. *Elatostemma thalictroides*:—5. Branch (nat. size). 6. Pedicel of male flower with bract and bractlets (×8). 7. Young male flower (×8). 8. Perianth of male flower with one stamen (×8).

C. *Elatostemma lithoneuron*:—9. Branch of a male plant (nat. size). 10. Male inflorescence (×2). 11. Male flower in bud (×8). 12. Young male flower, open (×8). 13. Female inflorescence (×3). 14. Portion of female inflorescence (×10). 15. Female flower with supporting bract (×20). 16. Fruit (×20).

D. *Pilea Johniana*:—17. Branch (nat. size). 18. Branchlet (×4). 19. 4-merous perianth of a male flower (×20). 21. 2-merous male flower (×20). 22. Stamen (×20). 23. Female flower (×20). 24. Bracts and staminodes of a female flower (×20). 25. Fruit (×10). 26. Fruit, transverse section (×20).

Plate XX.

A. *Patersonia borneensis*:—1. Branch (nat. size). 2. Lobe of stigma (×3). 3. Stamens, the tube cut open (×3). 4. Ovary, with style and stigma (nat. size). 5. Ripe capsules with supporting bracts (nat. size). 6. Capsule with seeds (nat. size).

B. *Patersonia Lowii*:—7. Branch (nat. size). 8. Lobe of stigma (×3). 9. Ovary with style and stigma (nat. size).

C. *Deyeuxia epileuca*:—10. Plant (nat. size). 11. Spikelet (×10). 12. First glume (×10). 13. Second glume (×10). 14. Third glume, with palea and produced rhachis (×10). 15. Flower (×20). 16. Caryopsis (×10). 17. Transverse section of leaf (×40).

J.N. Fitch imp.

A. 1-9. DECASPERMUM VITIS IDAEA. B. 10-12. EUGENIA KINABALUENSIS.
C. 13. E. AMPULLARIA. D. 14-17. TRISTANIA ELLIPTICA.

J. N. Fitch del. et lith.

A. 1-3. HEDYOTIS PROTRUSA. B. 4-6. H. PULCHELLA.
C. 7-9. H. MACROSTEGIA. D. 10. [illegible] GRACILE.

J. N. Fitch imp.

C.H. Fitch del. et lith.

J.N. Fitch imp.

A. 1-10. STREBLOSA URTICINA. B. 11-13. PSYCHOTRIA DENSIFOLIA.

A.1-3. DIPLYCOSIA PINIFOLIA B.4-6. D. KINABALUENSIS C.7. D. PENDULIFLORA
D.8-9 D. RUFA E.10-14. D. CHRYSOTHRIX

J.N. Fitch imp.

J. N. Fitch del. et lith. J. N. Fitch Imp.

A. 1-2. RHODODENDRON LACTEUM. B. 3. R. CUNEIFOLIUM.
C. 4-6. GAULTHERIA BORNEENSIS. D. 7-11. VACCINIUM CORDIFOLIUM.

C.H. Fitch del. et lith.　　A. 1-9. HAVILANDIA BORNEENSIS. B. 10-16. EUPHRASIA BORNEENSIS. C. 17-19. CYRTANDRA CLARKEI.　　J.N. Fitch imp.

C H Fitch del et lith.

J. N. Fitch imp

1-14. SCYPHOSTEGIA BORNEENSIS.

J. N. Fitch imp.

A. 1-4. QUERCUS HAVILANDII B. 5-8. FICUS SETIFLORUS
C. 9-10. LORANTHUS CENTIFLORUS

C. H. Fitch del et lith

J. N. Fitch imp.

A. 1-4. ELATOSTEMMA BULBOTHRIX. B. 5-8. E. THALICTROIDES.
C. 9-16. E. LITHONEURON. D. 17-26. PILEA JOHNIANA.

J.N. Fitch imp.

A 1-6 PATERSONIA BORNEENSIS. B 7-9 PATERSONIA LOWII.
C 10-16 DEYEUXIA EPILEUCA.

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BY

SPENCER LE MARCHANT MOORE, B.Sc., F.L.S.,
BOTANIST TO THE EXPEDITION.

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MAP TO ILLUSTRATE MR SPENCER MOORE'S BOTANICAL EXPLORATION OF THE PROVINCE OF MATTO GROSSO, 1891

Scale, 1cm — 10·000m

III. *The Phanerogamic Botany of the Matto Grosso Expedition*, 1891–92. *By* SPENCER LE M. MOORE, *B.Sc., F.L.S., Botanist to the Expedition.*

(Plates XXI.–XXXIX., and Map.)

Read 2nd November, 1893.

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NARRATIVE.

IN the month of June 1891 I heard from Mr. Carruthers, Keeper of the Botanical Department of the British Museum, that a botanist was required to join an expedition about to explore the Brazilian province of Matto Grosso. As I had been for years desirous of rendering my botanical education less incomplete by a visit to the Tropics, I readily acquiesced in Mr. Carruthers's suggestion that I should offer my services in the above capacity. On enquiry it was understood that a syndicate had obtained mineral rights over two large tracts of land in the province, the conditions comprising a survey and a geological and botanical examination of the territories in question, which included the country to the east of Cuyabá, the capital, and the large and almost entirely unknown region lying west of the fifty-seventh meridian, and between the tenth and fifteenth parallels of latitude. My offer was accepted on the part of the syndicate, and on July 2nd, after hasty preparation, I left Southampton in the company of Dr. John William Evans, who had been appointed geologist to the expedition.

Matto Grosso has been visited by several botanists, and, thanks to their united labours, the vegetation of a considerable part of the province is now fairly well known. The van appears to have been led by a Portuguese doctor, Alexandre Rodriguez Ferreira, who, departing from Pará towards the end of last century, made his way up the Madeira and Guaporé rivers to the then flourishing city of Matto Grosso (Villa Bella). He returned by the same route, and deposited his plants in the Museum at Lisbon, whence a set was, a few years ago, sent to the Herbarium at Kew. In 1825 Riedel, botanist to the Russian

expedition under Langsdorff, after collecting in Eastern Brazil, crossed the Paraná river, and entered Matto Grosso from the south. Riedel travelled up the Rio Pardo to Camapuan, and proceeded *viâ* the Taquari, Paraguay, São Lorenzo, and Cuyabá rivers to Cuyabá. Unaccompanied by Langsdorff, who selected the Arinos and Tapajos route, he advanced to Villa Maria and Matto Grosso city, thence descending the Guaporé and Madeira rivers to the Amazon. Then we find Dr. Patricio da Silva Manso, a Cuyabá physician who flourished during the earlier half of the century, sending to Lhotsky many plants from Cuyabá and the neighbourhood. These plants came into possession of Von Martius, and were distributed to various herbaria. Gaudichaud entered Matto Grosso during the second of his three voyages, that of the *Herminie* (1830–33). I have been unable to get any information about this voyage, of which no narrative, it would appear, was ever written—a singular fact, seeing that the other two journeys were so well and so exhaustively described. For this reason, it is impossible to say to which part of the province Gaudichaud went. Only a small district of Matto Grosso was visited by D'Orbigny, viz. the neighbourhood of the Forte do Principe de Beira on the Guaporé, whence he brought home a few plants. Ten years after Gaudichaud, Dr. Weddell began those travels which have made his name so famous. Finding himself at Goyaz, Weddell moved northward along the Araguaya to its junction with the Tocantins, which river he ascended, and, returning to Goyaz, entered Matto Grosso from the east and proceeded over the plateau to Cuyabá. Here he turned northward, reached Diamantino, and made a short circuit to the Arinos valley and back. Retracing his steps to Cuyabá, Weddell went down the Cuyabá, São Lorenzo, and Paraguay rivers as far as Olympo; whereupon, being refused admission into Paraguay, he turned back, visited Miranda on the Mondego river, and ascended the Paraguay as far as Villa Maria. A journey to Cuyabá and back preluded his advance over the watershed to Matto Grosso city, and from there he turned southward into Bolivia. Weddell's valuable collections are at the Paris Museum, and comparatively few of his plants have been taken up in the 'Flora Brasiliensis' of Von Martius. Finally the name of Tamberlik now and again occurs in the work just named, as that of a collector in "Western Brazil," but of the date as of the locality of his explorations I am in complete ignorance, and so cannot even say whether he was in Matto Grosso at all.

Arriving at Buenos Ayres we, on July 28th, transhipped into the Brazilian mail-boat, and proceeded up the River Plate. Our journey was uneventful, and on the morning of August 5th the Rio Apa was reached and we entered Matto Grosso. The most remarkable feature of this part of the river is the occurrence of forests composed exclusively of the Caranda Palm (*Copernicia cerifera*, Mart.). Extending for a considerable distance along the shore, these forests reach northward as far as the neighbourhood of Coimbrá. The massing of these Palms has a very peculiar effect, the grey stems simulating fog, from which the feathery crowns emerge clearly into view. Wherever a forest fire has raged, the base of their stem is blackened and the lowest leaves are apt to lose colour and hang pendent; otherwise fire has no apparent effect upon them. The vegetation bordering this part of the river appears, so far as one can judge, to be composed largely of *Cassia* and *Mimosa* scrub, with Malvaceæ, trailing Ipomœas,

Calystegia sepium, &c. The large, handsome, upright *Ipomœa fistulosa*, Mart., is also a prominent feature in the landscape, and the Lepacho tree (*Tabebuia Avellanedæ*, Lorentz), leafless, and covered, at this season, with a cloud of pink blossom, affords a fine spectacle to the traveller.

We steamed into Corumbá early in the morning of the 7th. Here it is necessary to tranship into a smaller vessel, and as this had not yet arrived at Corumbá on its downward journey, we were detained a day at that place, the fiscal capital of the province, and, as such, a town of some importance. Advantage was taken of this delay, and we went for a ramble through the woods, but with disappointing results, as, owing to its being the middle of the dry season, but few flowers were to be seen and most of the trees and shrubs were denuded of their leaves. A *Stephanophysum* * was common, and a lovely purple-flowered *Ruellia*; I also noted a *Waltheria* (probably *W. viscosissima*, A. St.-Hil.), a small *Croton*, *Momordica Charantia*, Linn., and the fine shrub *Cordia insignis*, Cham., then in full flower, while by the inundated bank of the river were *Eichornea azurea*, Kunth, and *Ipomœa fistulosa*, Mart., accompanied in places where the current was not felt by *Azolla americana* in plenty.

Next morning our boat left for Cuyabá, which city was reached on the 13th. While taking in wood at the various log-cutting settlements *en route* a few small specimens were hastily gathered; of these some have proved to belong to new species. An exceedingly common feature of the riverside flora is the prevalence of the willow-like *Alchornea castanoplia*, A. Juss., which forms a close fringe to the banks for a long distance.

On the 21st, favourable chances having been meanwhile seized of collecting in the neighbourhood of the city, a small expedition set off, under the charge of Mr. Arthur Whitehorn, a gentleman then resident in Paraguay, for the Chapada plateau, lying several leagues to the east of Cuyabá, and the westernmost extension of the great plateau of Matto Grosso. The country round Cuyabá consists of gently rolling land, fairly well timbered, and with abundance of shrubby vegetation. The subsoil is a red argillaceous earth, during the dry season baked as hard as a brick; this rests upon a platform of ancient slates, well exposed on the sides of deep watercourses which are dry at this time of the year. The traveller is struck by the curious appearance of the ground hereabout; this is due to the fact that, for miles around the city, the red earth has been turned over by gold-seekers, large quantities of the precious metal having been extracted here during the latter half of last century. As we passed, the woodlands were rather desolate, much of the vegetation being parched by the drought. Among the trees was seen a *Cochlospermum* (probably *C. insigne*, A. St.-Hil.), leafless now, but adorned with yellow blossom and cottony capsule; a Bignoniacea, most likely *Tabebuia aurea*, Benth. & Hook. f., bearing masses of golden flowers, and the Vochysiaceous *Salvertia convallariodora*, A. St.-Hil., its coarse ragged branches crowned with large woody fruits. Of shrubs one may mention the very common *Bauhinia obtusata*, Vog., with thick leaves, white petals, and lanky pods; Composites such as *Vernonia obovata*, Less., and *V. scabra*, Less.; Malpighiaceæ (*Heteropteris nudicaulis*, S. Moore; *Tetrapteris præcox*, S. Moore;

* My presses being packed up, no specimens were collected during this ramble.

Banisteria constricta, Griseb., an Amazonian plant); *Cassia dysophylla*, Benth.; Myrtles (*Myrcia dasyblasta*, Berg, *Eugenia miniata*, S. Moore); the pretty *Lippia lasiocalycina*, Cham., and many others. Grassy vegetation is abundant wherever circumstances favour its obtaining a foothold. *Arthropogon villosus*, Nees, *Andropogon* (*condensatus*, H. B. K., *ternatus*, Nees, *virginicus*, Linn.), *Melinis minutiflora*, Beauv. (the well-known "capim gordura" of the Brazilians), *Paspalum tropicum*, Doell, and the local *Panicum ansatum*, Trin., are all to be found here. On stream-sides you will see *Jussiœa nervosa*, Poir.; and although, with the exception of grasses, lowly vegetation is not abundant in August, yet such does occur; *Justicia metallicorum*, S. Moore, *Buchnera palustris*, Spreng., and the terrestrial orchid *Stenorhynchus australis*, Lindl., may be cited in support of the statement.

Through romantic scenery you ascend the plateau by a fairly good road, a creditable piece of engineering in so remote a part of the republic. Dr. Fonseca*, judging from the supposed heights of various places up the river from Buenos Ayres and Rosario to Corumbá (which place he considers to be nearly 400 feet above the sea), puts the elevation of Cuyabá at about 500 feet. This is at the port †, above which the ground whereon the city is built rises at least 150 feet higher. There is no sensible increase of level until the entrance to the pass is reached; approaching this, the escarpment of the plateau is seen extending on either hand far as the eye can reach, and rising to about 1800 feet above the lower country, this giving a total elevation of about 2500 feet above sea-level. It must be remembered, however, that this estimate, although probably fairly correct, is approximate only, the country never having been levelled. At the entrance to, or in, the pass I gathered *Erythroxylon daphnites*, Mart.; *Helicteres chapadensis*, S. Moore; the milk-white trusses of *Serjania perulacea*, Radlk., a beautiful climber; *Hirtella americana*, Aubl., and *H. collina*, S. Moore; the tall *Justicia oreadum*, S. Moore; *Piper asperiplium*, Ruiz & Pav.; *Spiranthes grandiflora*, Lindl.; *Renealmia foliosa*, S. Moore, with leaves a metre long, scarlet scapes and purple leaf-sheaths, as well as other plants.

The plateau is a good instance of that type of country called by Brazilians "cerrado." It consists of neglected-looking land with small, copiously branching trees, a certain amount of shrubby undergrowth, and grass in plenty, the latter sometimes forming small, almost treeless "campos." It is not without justice that travellers have compared these cerrados with orchard-land in our own country. Somewhat deep valleys, well timbered, and of which the bottoms are the beds of streams, often dry in August, cut into the plateau, whose uppermost portion is composed of brick-red sandstone, which weathers in places into grey castellated forms of wonderful variety. Among the trees on the plateau may be noticed *Byrsonima verbascifolia*, Rich., with a plentiful show of saffron flowers; the Lythraceous *Physocalymna scaberrima*, Pohl, its cloud of purple blossoms affording a splendid sight; *Luhea speciosa*, Willd.; Euphorbiaceæ such as *Maprounia guianensis*, Aubl., and *Mabea fistulifera*, Mart., *Connarus fulvus*, Planch., and many others. You are still accompanied by *Tabebuia aurea* ?, Benth. & Hook. f.; this you can distinguish even to the far distance by a golden gleam amidst surrounding boscage. The grassy plots are now and

* 'Viagem ao redor do Brasil (1875–1878),' Rio, 1881, (p. 35).

† Derby ('Physical Geography and Geology of Brazil,' p. 11, translated from 'O Brasil geographico e historico,' of J. E. Wappæus) gives 123 metres (about 400 feet) as the height of Cuyabá port.

again lit up by the carnation flowers of *Pavonia Rosa-sinensis*, A. St.-Hil., and in its neighbourhood you may gather sweet-scented *Kielmeyera* (*K. amplexicaulis*, S. Moore), *Turnera chrysodoxa*, S. Moore, tufted *Æschynomene oroboides*, Benth., and the straggling *Manihot tripartita*, Muell. Arg., var. *vestita*. The Labiate *Hyptis effusa*, S. Moore, remarkable for its long, capillary, almost invisible peduncles, rises to a man's height. Melastomaceæ are common—Miconias, *Clidemia rubra*, Mart., *Tococa fornicaria* Mart., the gorgeous *Tibouchina stenocarpa*, Cogn., &c.; *Lippia lasiocalycina*, Cham., *Chaptalia integrifolia*, Baker, *Trixis ophiorrhiza*, Gardn. (here, as in Eastern Brazil, a reputed alexipharmic), the fine heads of *Chuquiraga chapadensis*, S. Moore, the lowly *Cuphea micrantha*, H. B. K., *Eupatorium megaphyllum*, Baker, and masses of the common weed *Stachytarpheta dichotoma*, Vahl, will also be met with. Nor will a yellow-flowered Rubiacea (*Chomelia ribesiodes*, Benth.) escape notice, if only from the peculiar habit shown by its inflorescences of sheltering themselves from the broiling sun beneath a neighbouring leaf. The grasses, much the same as those met with in the low country, are frequently burnt by campo fires, but they suffer no permanent injury. Indeed, specimens belonging to this order, with charred outer leaf-sheaths, are common in herbaria, and most of my Chapada grasses show unequivocal signs of the action of fire.

We reached the decayed village of Sant' Anna da Chapada on the 25th and, the weather being superb, proceeded to sling our hammocks in a wood hard by. A little mountain stream, one of the feeders of Coxipo river, flows past the village, and in wet ground on its margin *Eleocharis sulcata* and *E. ochreata*, Nees, *Rynchospora glauca*, Vahl, and *Mayaca Sellowiana*, Kunth, were found, while *Eragrostis Vahlii*, Nees, and *E. multipes*, S. Moore, grew in plenty upon a bank skirting the stream. Other grasses of the place are *Paspalum paniculatum*, Linn., and *P. conjugatum*, Berg., *Panicum horizontale*, G. Mey., and *Melinis minutiflora*, Beauv. In shady places *Ichnosipha concinnus*, S. Moore, is to be seen, and you may collect *Xylopia grandiflora*, A. St.-Hil., Myrtaceæ (*Myrcia ambigua*, DC., and *M. chapadensis*, S. Moore), Miconias, a tree-fern, *Psychotria tomentosa*, Muell. Arg., &c., in the course of a short ramble. Noteworthy, too, is *Banisteria constricta*, Griseb., with its remarkable dimorphism. This shrub usually branches somewhat sparingly, and the branches bear large leaves; in places, however, the branches are much more numerous, and the leaves upon these are very small. We had, unfortunately, but two pack-mules, so that my supply of paper was soon exhausted, otherwise a larger collection could have been made upon this interesting plateau. We returned to Cuyabá on August 30th.

I continued collecting at Cuyabá, and, although Manso appears to have secured a considerable number of specimens here, was not unsuccessful in finding new species. The small tree *Anona Walkeri*, S. Moore, growing on the city outskirts, and *Eupatorium cuyabense*, S. Moore, may be cited in instance. Here I found *Copaifera elliptica*, Mart., the Apocynacea, *Anisolobus Zuccarinianus*, Mart., *Alibertia myrciifolia*, K. Schum. (a common shrub), *Bowdichia virgilioides*, H. B. K., *Hyptis* (*glauca*, A. St.-Hil., *crenata*, Pohl, *brunnescens*, Pohl), and the elegant little *Auratea Riedeliana*, Engl., rare in herbaria, but here abundant.

At Cuyabá we were joined by Lieut. Olaf Storm, of the Argentine Navy, prospective leader of the expedition, and by his brother Mr. John Storm, second in command, and it

being deemed advisable that a party in advance should make its appearance, as soon as possible, within the district embraced by the Western Concession, on September 7, after an interview with the Governor of the Province, we set off under the leadership of Mr. John Storm, for Santa Cruz (Barra dos Bugres), situated on the Paraguay river, about 100 miles to the north-west of the city. Lieut. Storm himself proposed returning to Corumbá, where he expected to receive from Europe the necessary funds. There he was to engage men, and transfer to the Villa Maria mail-boat the stores already at Corumbá. Meanwhile a small stern-wheeler, the *Explorer*, was on its way to Villa Maria under the charge of Mr. Noel Lofft Holden, who had directions to ascend the Paraguay and join us at Santa Cruz. Thence some of the party were to return at once by the *Explorer*, the rest proceeding with the mules by a difficult track to the Sipotuba river, on the banks of which a junction was to be effected. As we took but three pack-mules, the bulk of the scientific apparatus had to be sent back to Corumbá, a circumstance which, although absolutely essential, was most unfortunate, since our stay at Santa Cruz lasted much longer than had seemed at all likely when we set out.

The country between Cuyabá and the Paraguay river resembles in its external features that which we had already passed through to the east of the city, but it differs in being traversed by limestone and sandstone hills having a N.E. and S.W. trend. One of these hills, "Arara" by name, is probably nearly 2000 feet high. But before we reached the hills, on our arrival at the little settlement of Jangada, the temporary illness of one of the party brought us to a halt, which I turned to account by collecting specimens. The beautiful Vochysiaceous tree *Callisthene fasciculata*, Mart., was here in full bloom, as also was its lowly ally *Camarea ericoides*, A. St.-Hil. Here, too, were growing the dwarf Palm *Diplothemium jangadense*, S. Moore, *Byrsonima cydoniafolia*, A. Juss., *Tocoyena hirsuta*, Moric., with large sweet-scented *Gardenia*-like flowers, the tiny *Pectis jangadensis*, S. Moore, most nearly allied to two Mexican species, *Piper tuberculatum*, Jacq., *Julocroton humilis*, Didr., a lanky, nearly leafless *Eranthemum*, with blue flowers (*E. congestum*, S. Moore), the pretty *Zephyranthes lactea*, S. Moore, &c. In front of the principal inhabitant's house were a couple of large Taruma trees (*Vitex cymosa*, Bert.), almost leafless at this season of the year, but with a plentiful show of Oxford blue blossoms. These trees were festooned with the remarkable Loranthad *Struthanthus polyanthus*, Mart., var. *mattogrossensis*, which was in full flower at the time of our visit. Melastomaceæ I saw nothing of, a rather curious circumstance.

It is necessary to ford several streams on the journey to Santa Cruz. These streams, many of which are running throughout the year, flow in the bottom of shallow, well-wooded valleys. In the case of one of them, the rapid Curupira, the track runs for some distance through its valley, so that a person might fancy himself to be in a great forest did he not know the contrary. The reason for these narrow riverain mattos is undoubtedly that given by Liais *, who holds that the water needful to the growth of the trees is derived, while the dry season lasts, from the thick morning mists caused by excess in the temperature of the water over that of the air during the early morning hours.

* 'Climat, Géologie, Fauna et Géog. Bot. du Brésil,' p. 597.

Leaving Jangada on the 13th, we crossed the hilly country and at noon on the 15th dismounted before a "fazenda" on the Jocoara river, a tributary of the Paraguay. Upon the banks of this river grows a plant, presumably a species of *Ilex*, which furnishes a *maté* and is largely used by the inhabitants of the district. At the fazenda they were drying leafy branches of the shrub in a store, and when dry pounding them with strong wooden rods in a deep vessel made of wood. I did not secure specimens of the plant at that time; but soon after our arrival at Santa Cruz I instructed a messenger from Cuyabá, on his return, to beg the people to send me some material, and a small party from the *Explorer*, who went into the city on business some weeks after, also preferred the same request, and compliance was promised; for some reason, however, no specimen ever reached me. This *maté* is somewhat darker in colour than the Paraguayan kind, and yields a browner liquor, which is decidedly bitter to the taste. On September 16th we saw the waters of the Paraguay flashing in the morning sun, and our journey was at an end.

Santa Cruz, better known in the neighbourhood by the name of Barra dos Bugres, is situated on a low bluff upon the further, or, since its course is here almost due east and west, northern side of the Paraguay. On the southern side of the river there is here much low-lying open campo, and the river is approached through Bromeliaceous scrub. The bluff is composed of exceedingly fine-grained red shales, often greasy to the touch—these Dr. Evans distinguishes as Matto shales. The ground rises rapidly from the river, above which the upper part of the settlement stands some 100 feet; it is here of cerrado nature, but immediately beyond you suddenly enter a dense virgin forest, extending many miles to the northward. Close by, the small Rio dos Bugres joins the Paraguay, and this gives the place its alternative name. The Rio dos Bugres flows northward to the hills forming the southern escarpment of the great Amazonian plateau; it receives in its course the tributary Rio Brasinho, of which the feeders traverse the forest just referred to.

Of trees at Santa Cruz there are plenty, but the bulk of the vegetation consists of tall evergreen shrubs, usually more or less deprived of leaves in their lower part. Agreeably with what one sees in the country to the eastward, the trees for the most part do not grow very high, and they often have stout, greatly divaricated branches, invested in thick, sometimes locally swollen "bark," in all probability functioning as a preventive of evaporation. In a ramble round the settlement you will see the Vochysiaceous *Callisthene fasciculata*, Mart., and species of *Qualea* (*grandiflora*, Mart., *parviflora*, Mart., *pilosa*, Warm.), *Rheedia Guacopary*, S. Moore, with pleasantly acid yellow fruits used in place of vinegar by the people and esteemed as a bait for certain fish, and the Sterculiaceous *Guazuma ulmifolia*, Lam., much like a Lime in general appearance, its sweet-scented flowers the resort of neighbouring bees. For the fruit of the tall Siputa tree (*Salacia Siputa*, S. Moore) you must go to the river-banks, where will also be found the Cajá (*Spondias lutea*, Linn.), *Brosimopsis lactescens*, the type of a new genus of Artocarpeæ, also the myrmecophilous *Triplaris formicosa*, S. Moore. *Jacaranda cuspidifolia*, Mart., a species confined to the province, flaunts its dark blue

blossoms in the breeze; nor should *Curatella americana*, Linn., *Vismia japurensis*, Reichardt, and the Lepacho * be omitted.

Among shrubs Anonaceæ are conspicuous, especially *Anona coriacea*, Mart., var. *dioica*, A. St.-Hil., and *Stormia brasiliensis*, S. Moore. Species of *Helicteres*, including the curious *H. orthotheca*, S. Moore, with large straight capsule-valves, are common, as are the *Erythroxylons*, especially *E. nitidum*, Spreng. Bauhinias (*Bauhinia obtusata*, Vog., *B. cumanensis*, H. B. K., and others) frequently occur, and Malpighiaceæ (*Heteropteris*, *Banisteria*, *Byrsonima*), Myrtaceæ (*Eugenia*, *Myrcia*, *Psidium Araçu*, Raddi, yielding a pleasant fruit), Melastomaceæ (*Miconia*, *Clidemia*, &c.), and Coccolobas, the red-plumed tiny flower-heads of *Calliandra parviflora*, Benth., *Heisteria rubricalyx*, S. Moore, the tall *Oxalis hirsutissima*, Zucc., *Turnera odorata*, Rich., *Siparuna guianensis*, Aubl., *Nua hermaphrodita*, S. Moore, *Sorocea grandifolia*, S. Moore, may be mentioned among many others, as well as the East Brazilian *Brosimum Gaudichaudii*, Tréc. Palms, such as the Urubamba, the Tocúm, the Bocaúba, the Guacorý, occur here and there †. Climbers are plentiful: *Hiræas* (*volubilis*, S. Moore, and *sepium*, A. Juss.), Passion-flowers (*Passiflora tricuspis*, Mast., *P. coccinea*, Aubl.), Bignonias, *Dalechampia cuiabensis*, Muell. Arg., looking like a *Bougainvillea* with its pink involucral bracts, the fine red-flowered *Anguria gloriosa*, S. Moore, and *Smilax medicinalis*, S. Moore, are worthy of notice. Another common order is that of the Rubiaceæ. You will often find little sandy stretches by the river-side brightened by the small pink-blossomed gregarious *Sipanea veris*, S. Moore, and *Richardsonia grandiflora*, Cham. & Schlecht., and *R. pilosa*, H. B. K.; *Borreria cupularis*, DC., *Diodia saponarioides*, Presl, and *D. multiflora*, DC., as well as *Sabicea humilis*, S. Moore, are all lowly members of this order, belonging to which one may cite, among the shrubs, Coussareas, *Faramea coussarioides*, S. Moore, *Rudgea viburniodes*, Benth., *Mapourea tomentella*, S. Moore, *Psychotria subcrocea*, Muell. Arg., resplendent with coralline peduncles and yellow flowers, *Chiococca brachiata*, Ruiz & Pav., the Amazonian *Randia Ruiziana*, DC., var. *longiflora*, K. Schum., and the remarkable new *Alibertia verrucosa*, with warted berries, made into a preserve by the Santa-Cruzans. Among monocotyledonous herbs you will see, nestling in the shade of shrubby covert, the delicate trumpet-shaped golden flowers of *Costus acaulis*, S. Moore, *Calatheas*, the new *Maranta longiscapa*, and *Renealmia Holdeni*, *Zygella graminea*, S. Moore, ground aroids (*Caladium heterotypicum* and *Aphyllarium tuberosum*, both new to science), *Herreria Salsaparilha*, Mart., and several others. A small brook, nearly dry in October, runs through the settlement. On its bank or growing in its bed you may come across, *inter alia*, *Aciotis dichotoma*, Cogn., and *Acisanthora inundata*, Triana, both Melastomaceæ; Heliotropes (*Heliotropium indicum*, L., *inundatum*, Sw., *filiforme*, H. B. K.), *Conobea scrophularioides*, Benth., a little blue-flowered Scrophularia, and *Polygonum acre*, H. B. K. *Peperomia*

* I did not see this tree in flower at Santa Cruz, but our woodcutters by preference selected dead Lepacho wood all the way up the river. If the Santa Cruz plant be not true Lepacho, it is most probably closely allied to it; at any rate, it has the same peculiar greenish wood.

† I did not pay special attention to this group, and, judging from the few specimens brought back, the various local names are here applied to Palms specifically distinct from those known by the same names in the eastern provinces.

nummularifolia, H. B. K., clings to the shady trunks of trees, wherefrom hang the gorgeous trusses of *Cattleya superba*, Schomb., the hitherto nearest known habitat of which lies hundreds of miles to the north.

In grassy places one can gather Paspalums, Panicums, Setarias, *Eleusine indica*, Gaertn., *Leptochloa domingensis*, Trin., and the little new *Luziola pusilla*, with which specimens absolutely identical from Guiana are in the Herbarium at Kew. One may complete the list by citing the names of a few lowly dicotyledons, such as *Ruella humilis*, Pohl, with milk-white flowers, Stenandriums, the exceedingly common *Scoparia dulcis*, Linn., *Dianthera polygaloides*, S. Moore, the peculiar Amazonian *Stilpnopappus viridis*, Benth., *Rhodocalyx rotundifolius*, Muell. Arg., and the pretty little *Desdemona pulchella*, the type of a new genus of Scrophulariaceæ.

The *Explorer* not having yet succeeded in surmounting the difficulties of navigation between Villa Maria and Santa Cruz, an expedition was arranged with the object of making its way through the forest to the Serra de Tapirapuan, the geology of which, it was thought, might prove interesting. The forest covers a tract of land lying some 150 feet above the Paraguay. At intervals small streams, most of which run eastward into the Brasinho, traverse the line of route, which latter soon becomes a narrow foot-track used by the "poayeros," or gatherers of ipecacuanha. There are no inhabitants except during the period of securing the valuable root, which, in this part of Brazil, is the wet season. For the accommodation of the poayeros small groups of palm-thatched huts have been erected at various points in the forest. As will readily be understood, the obstacles to the passage of a mule-train along such a track, ever liable to obliteration by the encroachment of vegetation, are by no means slight, and it is owing partly to this that my collection from the forest-region is not a large one; it was also necessary to hurry on our way, as our supply of food was limited.

To judge from the descriptions of travellers, this forest has many points of resemblance with other primeval forests of the country. Trees, supported sometimes on gigantic boles, raise their lofty crowns far above the traveller; lianes of various kinds everywhere interpose to entangle the steps of his mule; tree-aroids may be seen perched far beyond his reach; epiphytic orchids abound. Except for the roar of an occasional storm as it sweeps by, the deepest silence prevails—silence broken only now and again by the *crick-crick* of a Cicada. Shafts of light slant through the living canopy to illuminate the metallic lines of great *Morpho* butterflies heavily flopping through the semi-darkness. Before you entered the forest, the probability is that the intense heat of the sun was mitigated by a fresh breeze, and although the sun's rays cannot penetrate the sylvan recesses, the wind also is shut out, and you experience a feeling of oppression in consequence. Everywhere you will find the same kinds of shrubby vegetation, vegetation specially adapted to flourish in deep shade. Foremost among these shade-loving plants are Rubiaceæ, especially species of *Psychotria*; the epiphytic aroids are Anthuriums and Monsteras; Peppers are conspicuous from the curious way in which their flower-spikes stand out rigidly from their leaves, as if movements of the latter against the flowers might cause loss of pollen; the little *Peperomia nummularifolia*, H. B. K., is everywhere; tall Solanums, *Tabernæmontana* bushes bearing white flowers exhaling a strong scent as

of new-mown hay, and species of *Erythroxylon*, *Alloplectus*, *Bignonia*, *Ischnosiphon*, *Dalechampia*, *Guarea*, *Allophyllus*, swell the list of these dwellers in the twilight glades. Orchids you may gather in plenty, most of these, however, not in flower during September; chief among those then in bloom are *Cattleya superba*, Schomb., and *Rodriguezia secunda*, Ruiz & Pav. (the latter, like the former, hitherto not found in this part of Brazil), also Dichæas, Notylias, &c. The chief feature to notice about this forest-flora is its strongly pronounced affinity with that of the great Amazonian country to the north. I shall return to this matter later on.

Now and again the track will emerge from dense forest to cross a short stretch of campo, at the most not more than a few hundred yards in width. The origin of these small campos must, I think, be ascribed to fires, for it is difficult to understand how conditions favourable to forest-growth should suddenly cease and become operative again at so short a distance. There is, of course, the alternative suggestion that the district has been the theatre of much physical change, and that these strips of campo occupy the sites of large rivers which formerly drained the region. But there are reasons for preferring the former view. Close to Tapirapuan, however, the case is different. There the forest ends suddenly, and after passing a narrow fringe of cerrado, you descend upon a grassy campo about a mile in width, beyond which, flanked by a similar cerrado fringe, suddenly rises the tree-clad Serra de Tapirapuan, here trending almost due east and west. One is led to suspect that the waters of a broad river may at one time have flowed down this grassy valley, and to-day a small stream, probably larger during the rainy season, does actually meander through it. I obtained but few plants on the campo, *Bletia catenulata*, Ruiz & Pav., a beautiful ground orchid, hitherto found, unless I mistake, only in Guiana and Peru, the new *Herpestis parvula*, a tiny inhabitant of the streamlet, and the Cycad, *Zamia Brongniartii*, Wedd., being almost all. This Cycad I afterwards found in plenty at Santa Cruz, which place marks the S.E. limit of known Cycad distribution in South America.

Our provisions being nearly exhausted, we hastened back to Santa Cruz, from which place we had been absent a week, and a few days after, on Oct. 5th, we were joined by the party in the *Explorer*. With the boat two expeditions were made: in the first of these we ascended the Rio dos Bugres, which was soon found to be no longer navigable, whereupon we proceeded in a canoe up that river and up the Rio Brasinho for some distance through the forest. Among the plants found hereabout may be named *Mouriria guianensis*, Aubl., *Mapourea Martiana*, Muell. Arg., *Psychotria subcrocea*, Muell. Arg.; *Anæmopægma sylvestre*, a new Bignoniad with white flowers; a new *Dichæa* (*D. cornuta*), near *D. graminoides*, Lindl., from Guiana; *Epidendrum variegatum*, Hook., very common on trees overhanging the river; another orchid, apparently an *Epidendrum* belonging to the section *Amphiglottium*, with the curious habit of producing new shoots from its persistent flower-scapes; and *Randia Ruiziana*, DC., var. *longiflora*, again. Our second journey was up the Paraguay, with the object of reaching Diamantino if possible. The river runs through a belt of forest, beyond which, out of the reach of the precipitated moisture derived from fluviatile mists, there is much open campo. In the shade of these riverside strips of forest grow plants often conspecific with or nearly related to

those found in the great forest; and the flora as a whole has a large Amazonian element, not unalloyed, however, with a considerable proportion of East-Brazilian types. It must suffice to mention here Ingas (*Inga nobilis*, Willd., and *I. edulis*, Mart.), the flowers of which are often haunted by clouds of white and yellow butterflies belonging to the genus *Callidryas*; a *Sloanea* (probably *S. Maximowiczii*, K. Schum.); the beautiful shrub *Miconia stenostachya*, DC., with masses of white bloom variegated by the yellow of its anthers; the red-blossomed Passion-flower, *Passiflora vitifolia*, H. B. K.; *Faramea bracteata*, Benth., a Goyaz plant; Psychotrias; *Ipomœa setifera*, Poir.; the Amazonian *Croton Cajucara*, Benth.; a *Vanilla* with ensiform leaves, probably *V. ensifolia*, Rolfe—a New Granada species; the new *Bromelia sylvicola*; and *Epidendrum imatophyllum*, Lindl., a Guiana orchid.

We did not succeed in reaching Diamantino, and, on our return to Santa Cruz, were still without satisfactory intelligence concerning the prospects of the main expedition. It was now the rainy season, and the district was frequently visited by thunderstorms, which almost always came, so far as one was able to note, from the north, north-east, or north-west. In consequence of the rain, a number of plants growing in the drier situations suddenly burst into flower, so that collecting became very profitable. Things continued in this state till Dec. 8th, when we received directions to come down to Corumbá. On the way I made use of several small opportunities to collect plants while wood was being cut. We stayed a few hours at Villa Maria, now better known by its modern name, San Luiz de Caceres, and arrived at Corumbá soon after midnight on Dec. 17th.

Corumbá is situated on the western—here, in consequence of a turn in the river, southern—side of the Paraguay, almost the 19th parallel of south latitude. The town stands upon a bluff overlooking a wide expanse of low-lying country to the north, much of which is said to be under water during some period of the year. The geological structure is a hard limestone, the age of which Dr. Evans was unable to ascertain in consequence of the absence of fossils, but which is almost certainly Palæozoic. Considerable quantities of rain having fallen since the time of our passage up the river, the aspect of things vegetable was now very different, and many plants were preparing to blossom or were actually in flower. Several rough tracks run out from the city through dense boscage, consisting for the most part of tall shrubs or small trees, larger trees being now and again met with. Fringing the river-side is a low-lying sandy area plentifully strewn with bushes and variegated with ponds and small pools, the haunt, I was told, of the *Victoria regia*, a statement I was unable to confirm. In one place this low-lying land is about 400 yards wide; elsewhere it is narrower, or the bluff may come close up to the water. At the time of our former visit, the greater part of this ground was under water although it was the dry season—the fact being that during the up-country wet season the water is low at Corumbá, and *vice versâ*; yet the seasons are synchronous, or nearly so, in the two regions—a striking testimony, this, to the extent of country drained by the Paraguay river. Walking by the river-side you will be surprised at the large amount of *Croton* scrub (*C. nivifer, corumbensis, doctoris*, all new species) exhaling its peculiar aromatic odour, evidently very attractive to insects; Cassias (*Cassia alata*, Linn.,

and *Tora*, Linn.) are in full flower in January. *Dianthera paludosa*, Sm., *Cuscuta obtusiflora*, H. B. K., *Ipomœa fistulosa*, Mart., sometimes forming dense thickets, *Leonotis nepetæfolia*, R. Br., frequently occur, and *Momordica Charantia*, Linn., spreads a literal carpet over large spaces of ground. Climbing the shrubs are the Amazonian *Centrosema vexillatum*, Benth., also *Phaseolus lasiocarpus*, Mart., Bignoniads, Ipomœas, and Passion-flowers; and the Goyaba tree, here often attacked by the Loranthad *Psittacanthus cordatus*, Blume, and covered with its red blossoms at this time of year, is a feature in the landscape. On the slopes facing the river and on the top of the bluff many plants will be found: such as Coccolobas; *Jatropha vitifolia*, Mill., in wearying iteration; an orange-flowered *Cereus*; *Pereskia Bleo*, DC., with its pale purple flowers; *Thyallis Laburnum*, a Malpighiaceous shrub new to science, reminding one, when blossoming, of our familiar Laburnum tree; a fine Leguminous tree, *Pterocarpus Rohrii*, Vahl, with species of *Sesbania*, *Bauhinia*, *Psidium*, *Ranwolfia*, *Thevetia*, *Julocroton*, and many others; while of climbers we have Bignoniads, *Teramnus volubilis*, Sw. (like *Centrosema vexillatum*, Benth., an Amazonian species), a flowerless *Dioscorea* with bright purple leaves, *Rhabdadenia Pohlii*, Muell. Arg., *Thinouia sepium*, S. Moore, &c. The pretty little *Talinum crassifolium*, Willd., grows in masses upon the open ground, accompanied by a *Cyphiacanthus*, flowering specimens of which I, by some oversight, failed to secure. The streets of the town are enlivened by the brilliant blossoms of *Cæsalpinia pulcherrima*, Sw., planted here of course; and at the custom-house are some fine fig-trees (*Ficus Elliotiana*, S. Moore). *Cratæva Tapia*, Linn., too, with its spreading leafy branches, affords most grateful shade. The river has its usual fringe of "camalote" mingled with grasses, Jussiæas, &c., and large islands composed of these plants float out from the neighbouring "riacho" or backwater called the Bahia de Caceres and become stranded along the shore, where the camalote is greedily eaten by cattle and pigs.

Our stay at Corumbá lasted six weeks; it was varied by a short trip to Carandajinho, a small wood-cutting and cattle-raising station a few leagues up river. Here I found, upon marshy ground liable to inundation, large pink trusses of *Rhabdadenia Pohlii*, Muell. Arg.; *Cassia aculeata*, Benth., *Æschynomene sensitiva*, Sw., *Byttneria campestris*, S. Moore, and a *Corynostylis*, an Amazonian genus of which I saw no signs further up the river, were also gathered. In the ponds here were found the handsome aquatics, *Thalia geniculata*, Linn., and *Echinodorus paniculatus*, Micheli. Festooning the trees on the river-bank was *Macfadyenia laurifolia*, Miers; but I was able to do but little work here, and that only in the immediate neighbourhood of the boat, to which latter I was confined by indisposition during most of the time our visit lasted.

We left Corumbá in the *Explorer* on Feb. 1st, having a few days previously been joined by Lieut. Storm, who in the meanwhile had gone to Buenos Ayres with the view of placing himself in telegraphic communication with Europe, and had returned with intelligence of so unsatisfactory a character that no option was left him but to abandon the expedition. On our way down we called at Coimbrá, picturesquely placed on the western bank of the river. Here we paid a visit to some limestone caves, which Weddell * tells us he also explored. To reach the caves you have to make your way

* Ann. d. Sc. Nat. 3me série, xiii. p. 61 (in note).

through tall grass, as high as a man. This grass is *Andropogon condensatus*, H. B. K., var. *paniculatus*. Growing in the grass you will see here and there the *Allamanda*-like *Thevetia bicornuta*, Muell. Arg., a Paraguayan species found as far to the north as Corumbá, and on the river-bank you will find *Angelonia Gardneri*, Hook., *Teramnus volubilis*, Sw., the curious *Baillonia amabilis*, Bocq., *Tephrosia brevipes*, Benth., *Mimosa cinerea*, Vell., and grasses (*Panicum*, *Setaria*, *Imperata brasiliensis*, Trin., and the new genus *Pogochloa*), while the inevitable camalote swarms at the waterside.

There is little more to tell. Soon after leaving Coimbrá we reached the region of the Caranda forests; dead logs of these trees were taken on board, for they yield excellent fuel. On Feb. 3rd we were at Puerto Pacheco, a small settlement founded by the Bolivians, but then in possession of a Paraguayan force. A short ramble in the neighbourhood yielded several plants of interest, including *Prosopis ruscifolia*, Griseb., a Chaco type with very large and strong spines; the Argentine *Tabebuia nodosa*, Griseb., a curious plant having Cuban affinities; *Coccoloba paraguariensis*, Lindau; *Paspalum simplex*, Morong; and new species of *Wissadula*, *Mimosa*, *Morrenia*, *Croton*, and *Julocroton*. But we could make no stay here; our funds were exhausted, and it was necessary to hasten on to Asuncion; at that place, which we reached on Feb. 7th, the expedition was disbanded.

Short Sketch of the Climatology of Matto Grosso.

In order that we may understand the origin and nature of, and satisfactorily study the relations borne by the flora of a country to that of neighbouring regions, some knowledge of its climate, if it be not essential, is, at least, manifestly advantageous. I trust therefore that no apology is needed for presenting to the reader the following short sketch, to a large extent compiled from various available sources. Nor have I refrained from adding a few observations made by myself during our expedition. It must be understood that at Santa Cruz, the climatology of which is quite unknown, with the exception of a couple of ordinary thermometers, we had no recording instruments whatever; that we went there in the expectation of making but a short stay; and that, for all we knew, the order for our departure might arrive any day. Hence it did not seem worth while to commence a series of observations which must necessarily have proved most imperfect, and were liable to cease at a short notice.

The dry season lasts from March or April to September, and during this period storms and rain are exceedingly rare. They do sometimes occur, however; thus, on the night of Aug. 11th, when we were nearing Cuyabá, on our upward journey, a violent thunderstorm, accompanied by a perfect deluge of rain, broke over the country. At the beginning of September a premonitory storm or two pass over, soon followed by the regular wet season. For a tropical country the rainfall is not high. Dr. Morsback *, as the result of three years' observations, got an annual average of 1166 mm., that is between 45 and 46 inches, only a trifle greater than the rainfall at Rio. The reason for this must, I think, be sought in the geographical position of the city, and in the nature and direction of the prevailing winds, which blow mostly from the north, north-west, and north-east.

* 'Revista do Observatorio,' Rio, 1890, p. 91.

These winds bring moisture from the low-lying Amazonian region, moisture which is, however, largely intercepted by the high plateaux lying to the north of the province. On the other hand, south winds, generated in or having to pass over the dry Pampas, will not carry much moisture with them. To judge from our experience at Santa Cruz and at Corumbá, there is much fine weather during the wet season, several days of brilliant sunshine sometimes intervening between the storms; and this is borne out by the observations of Lt.-Col. Americo Rodrigues de Vasconcellos * at Cuyabá, this observer recording for January and February 1889, the middle of the wet season, only 11 and 15 rainy days respectively.

The main feature in the temperature is its liability to great and sudden variations. I may cite in illustration the testimony of Dr. João Severiano da Fonseca †, who accompanied as doctor the Brazilio-Bolivian Boundary Commission of 1875–78. On June 19th of one of these years, on the Cuyabá river, he noted a temperature of 35° C. at 2 o'clock P.M., and by 10 o'clock that night the mercury had fallen to 7°·5 C.: that is, an oscillation of more than 50 degrees F. within eight hours! This is, of course, an extreme case. On another occasion he recorded a sudden fall, during a hailstorm, of as much as 18°·7 C. In the highlands frosts are reported to occur sometimes, nearly every year, between June and September, and the Indians are occasionally frozen to death; moreover, the young coffee-bushes are then liable to destruction. Fonseca also says that one morning, near the 16th parallel of south latitude, he saw the ground covered with hoar-frost and the puddles frozen over, and this at the level of the river! During Dr. Morsback's three years at Cuyabá, the temperature varied between 41°·9 C. and 7°·2 C. This temperature of 41°·9 C. (upwards of 107° F.) is, so far as I am aware, the highest on record for the province. Our highest at Santa Cruz was 38°·5 C. on Monday, Oct. 12th.

As an instance of the daily range of temperature, I take the opportunity of citing the following figures, deduced from De Vasconcellos's observations at Cuyabá for July 1888 ‡:—

	7 A.M.	10 A.M.	1 P.M.	4 P.M.
Average monthly temperature in the shade......	19°·06 C.	25°·98 C.	30°·63 C.	30°·81 C.

The hottest period of the day is usually some time between 1 and 4 P.M. At Santa Cruz the maximum was generally reached at about 3 P.M., though exceptions often occur, the mercury at 6 o'clock sometimes standing higher than at any earlier hour of the day. Moreover, the morning hours are occasionally the hottest.

The oscillations of the barometer are but slight; the maximum monthly oscillation, as set forth in the tables to which I have had access, amounts to rather more than 13 millimetres (Cuyabá, August 1888, De Vasconcellos), but this is quite exceptional, as the subjoined figures will show:—

* 'Revista do Observatorio,' Rio, 1889, pp. 66 and 83.

† 'Viagem ao redor do Brazil,' Rio, 1881.

‡ 'Revista do Observatorio,' Rio, 1888, p. 185.

Observations at Cuyabá made by Lt.-Col. Americo Rodrigues de Vasconcellos *.

Month.	
July 1888.	Barometer reduced to 0° C.: Max. 751·73 mm.; Min. 745·28 „; Mean 748·34 „
	Temperature in the shade: Max. 36°·3 C. (lowest day max. 34°·9 C.). Min. 14°·5 C. (highest night min. 20°·9 C.). Mean 28°·0 C.
	Average tension of aqueous vapour: 12·76.
	Relative humidity: 53·9.
	Wind: variable on 17 days; N. or N.W. 8 days; S. or S.E. 6 days.
	No rain fell during the month.
August 1888.	Barometer reduced to 0° C.: Max. 754·44 mm.; Min. 741·37 „; Mean 746·24 „
	Temperature in the shade: Max. 39°·9 C. (lowest day max. 17°·7 C.). Min. 10°·5 C. (highest night min. 24°·6 C.). Mean 30°·2 C.
	Average tension of aqueous vapour: 13·38.
	Relative humidity: 44·6.
	Wind: N., N.E., or N.W. during greater part of month; S. or S.W. on 4 days.
	Rainfall: 0·4 mm. on one day only.
September 1888.	Barometer reduced to 0° C.: Max. 747·48 mm.; Min. 740·16 „; Mean 747·48 „
	Temperature in the shade: Max. 40°·9 C. (lowest day max. 26°·9 C.). Min. 20°·5 C. (highest night min. 27°·1 C.). Mean 30°·6 C.
	Average tension of aqueous vapour: 20·4.
	Relative humidity: 63·8.
	Wind: N., N.E., or N.W. 14 days; S.W. 2 days; variable 14 days.
	Rainfall: 52·07 mm. Rainy days 10.

* 'Revista do Observatorio,' 1888 and 1889, *passim*.

Month.	
October 1888.	Barometer reduced to 0° C.: Max. 746·96 mm. Min. 730·12 „ Mean 743·27 „ Temperature in the shade: Max. 37°·4 C. (lowest day max. 28°·9 C.). Min. 21°·8 C. (highest night min. 26°·1 C.). Mean 31°·0 C. Average tension of aqueous vapour: 21·60. Relative humidity: 66. Wind: N., N.E., or N.W. 15 days; S. or S.E. 2 days; variable 14 days. Rainfall: 38·8 mm. Rainy days 10.
January 1889.	Barometer reduced to 0° C.: Max. 747·10 mm. Min. 741·04 „ Mean 744·30 „ Temperature in the shade: Max. 39°·9 C. (lowest day max. 29°·4 C.). Min. 22°·1 C. (highest night min. 25°·4 C.). Mean 30°·4 C. Average tension of aqueous vapour: 21·87. Relative humidity: 68·7. N.W. wind predominant. Rainfall: 145·7 mm. Rainy days 11.
February 1889.	Barometer reduced to 0° C.: Max. 747·19 mm. Min. 740·90 „ Mean 744·67 „ Temperature in the shade: Max. 37°·9 C. (lowest day max. 29°·9 C.). Min. 22°·2 C. (highest night min. 22°·2 C.). Mean 30°·7 C. Average tension of aqueous vapour: 21·90. Relative humidity: 68·0. Predominant wind: N.W. Rainfall: 138·8 mm. Rainy days 15.
March 1889.	Barometer reduced to 0° C.: Max. 747·9 mm. Min. 740·99 „ Mean 744·62 „ Temperature in the shade: Max. 38°·5 C. (lowest day max. 27°·9 C.). Min. 22°·5 C. (highest night min. 24°·6 C.). Mean 29°·8 C. Average tension of aqueous vapour: 21·44. Relative humidity: 69·8. Predominant wind: N.N.W. Rainfall not given.

Month.	
April 1889.	Barometer reduced to 0° C.: Max. 748·58 mm.; Min. 741·32 „; Mean 745·50 „
	Temperature in the shade: Max. 37°·8 C. (lowest day max. 21° C.). Min. 15°·3 C. (highest night min. 23°·5 C.). Mean 29°·5 C.
	Average tension of aqueous vapour: 19·95.
	Relative humidity: 66·8.
	Predominant wind: N.
	Rainfall not entered.

It will here be useful to append Dr. Morsback's * results, obtained at the cost of three years' observation at Cuyabá, from July 1884 to June 1887:—

Barometer: Highest mean 750–757 mm.; Lowest mean 738–740 „; Annual mean 744–745 „

Temperature in the shade: Max. 41°·9 C. Min. 7°·2 C. Mean 26°·25 C. Monthly mean: highest 25°·0 C. Sept.–May; lowest 25°·0 C. June–Aug.
Mean temperature at 7 A.M. 21°·9 C.
„ „ „ 2 P.M. 33°·77 C.
„ „ „ 9 P.M. 23°·06 C.

Average annual rainfall: 1166 mm. Mean of rainy days: 85.

A few figures have recently been obtained for Corumbá; they are here recorded:—

Observations made at Corumbá by the Matto Grosso Military Engineering Commission under Capt. Jorge dos Santos Almeida †.

Month.	
November 1889.	Barometer: Max. 751·0 mm.; Min. 740·9 „; Mean 746·4 „
	Temperature in the shade: Max. 36°·4 C. (lowest day max. 26°·5 C.). Min. 17°·5 C. (highest night min. 27°·4 C.).
	Rainfall: 189·9 mm. Rainy days: 13.
	Predominant winds: N.E. and N.W.
December 1889.	Barometer: Max. 751·1 mm.; Min. 739·3 „; Mean 745·9 „
	Temperature in the shade: Max. 35°·8 C. (lowest day max. 23°·4 C.). Min. 18°·3 C. (highest night min. 27°·5 C.).
	Rainfall: 240·9 mm. Rainy days: 15.
	Wind: Generally N.E. or N.W.

* 'Revista do Observatorio,' Rio, 1890, p. 91.

† *Ibid.* 1890, pp. 30, 47, 63.

Month.	
January 1890*.	Barometer: Max. 753·3 mm. / Min. 742·0 „ / Mean 747·5 „
	Temperature in the shade: Max. 33°·8 C. (lowest day max. 24°·7 C.). / Min. 19°·8 C. (highest night min. 27°·0 C.).
	Rainfall: 150·5 mm. Rainy days: 11.
	Wind: Predominantly N.E. or N.W.

Here follow a few figures obtained by myself at Santa Cruz during the few days of my confinement to the boat from indisposition, which prevented collecting:—

Shade Temperatures at Santa Cruz, Nov. 1891 (Centigrade scale).

Nov. 19th. P.M. 1, 33°·5; 2.30, 34°; 3.0, 35°·5; 4, 35°·3; 4.30, 35°·3; 5, 33°·5; 5.30, 29°·7.

Nov. 20th. A.M. 7, 26°; 8, 26°·8; 9.15, 29°; 10.15, 30°·5; 11.15, 32°·3.
P.M. 12.15, 33°; 1.30, 34°; 2.30, 35°·5; 4, 35°; 5, 34°·8; 6, 32°·5; 7, 29°.

Nov. 21st. A.M. 6, 19°; 7, 19°; 8, 26°·8; 9, 30°·4; 10.30, 34°·2; 11.30, 35°·8.
P.M. 12.30, 35°·2; 1.30, 35°; 2.30, 36°·5; 3.30, 36° 2; 4.30, 32°; 5.30, 28°·8; 6.30, 27°·3.

Nov. 27th. A.M. 8.30, 23°·5; 9.30, 24°·7; 10.30, 28°·8; 11.30, 29°·2.
P.M. 12.30, 31°·2; 2, 32°; 3, 32°; 4, 30° 5, 26°·4; 7.15, 25°.

Nov. 28th. A.M. 6.45, 20°·6; 7.45, 21°·3; 9.15, 24°·5; 10.15, 27°·8; 11.15, 30°·4.
P.M. 1, 31°·6; 2, 32°; 3.15, 32°·5; 4.15, 32°·2; 5.30, 31°·8; 6.45, 30°·4; 8, 26°·3.

Nov. 29th. A.M. 6.30, 20°·2; 7.30, 22°·6; 9, 26°·8; 10·30, 31°·2; 11.30, 33°·5.
P.M. 2.15, 33°·5; 3.15, 34°; 5.15, 34°·5; 6.15, 34°; 7.15, 30°·2; 8, 28°·4.

Nov. 30th. A.M. 7, 22°·2; 8, 23°·5; 9, 27°; 10, 32°·2; 11, 33°·3.
P.M. 12.30, 35°; 1.30, 35°; 2.30, 33°·8; 3.30, 34°·8; 5, 35°·7; 6, 35°; 7, 33°·2.

Weather at Santa Cruz.

Nov. 16th. Fine day with fresh breeze; no rain; distant thunder. Temperature at 1 o'clock 32°·2C.
17th. Fine day, fresh breeze. A little rain in morning. Temperature at 2 o'clock 34° C.
18th. Distant thunder early afternoon: thunderstorm from N.E. early evening. Temperature shortly after 2 o'clock 36° C.
19th. Distant thunder heard in the south at 4 P.M.
20th. Overcast morning; fine afternoon; no rain; no thunder.
21st. Fine morning; short rainstorm in afternoon, with a little distant thunder. Lightning in S.E. during evening.
22nd. Heavy thunderstorm from N.E. lasted several hours this morning.
23rd. Rain during night, with some lightning.
24th. Heavy rain for upwards of an hour in morning. Fine afterwards.
25th. Heavy shower from S.W. during morning. No thunder.
26th. Fine day; no rain; no thunder.
27th. Thunderstorm from S.E. between 7 and 8.30 A.M. with heavy rain. Lightning in evening.

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* By a clerical error this is given as a result for Dec. 1889.

Nov. 28th. Brilliant day; no rain; no thunder.
29th. Fine day, only very slight shower of rain.
30th. Early part of evening stiflingly hot; thunderstorm burst soon after 8 P.M.
Dec. 1st. Fine day. Highest temperature 37°·3 C., just before 5 o'clock.
2nd. Fine day, without rain. Highest temperature precisely as on preceding day.
3rd. Fine morning. Afternoon a distant thunderstorm, with little rain.

The above figures show the diurnal range of temperature, and bring out clearly the fact that, at least in November, the air is hottest after 2 P.M.; indeed, on Nov. 29th and 30th the maximum was not reached before 5 o'clock, and, remarkably enough, at 7 in the evening of the latter day the mercury actually stood higher than at any hour of the two days preceding the 29th. A cursory inspection of the weather column will show a confirmation of the statement already made, that intervals of brilliant weather may be experienced during the wet season; thus, for the week ending Dec. 2nd we find, but for a couple of thunderstorms, fine weather prevailing throughout.

The Botanical Geography of Brazil.

For the earliest generalizations of any practical value bearing upon the botanical geography of Brazil we must go to Von Martius, whose views were adopted in those earlier volumes of his great 'Flora Brasiliensis' which were published before the eminent traveller's death, and are still recognized in the various parts issued and now issuing. Martius distinguished the low watered plains of Brazil as the *Naiad* region, while to the tropical mountain forests of Rio de Janeiro and the eastern coast he applied the term *Dryad* region. The back parts of the provinces of Bahia and Pernambuco have an exceedingly hot and dry climate, which the uplands of Ceará, Piauhy, and the neighbouring provinces also share; this is the *Hamadryad* region. An *Oread* region is also distinguished; it comprises the uplands of Minas Geraes, Goyaz, Matto Grosso, and São Paulo. The small portion of the country lying south of the Tropic of Capricorn Von Martius distinguishes as the *Napæa* region. In the year 1872 appeared Grisebach's 'Vegetation der Erde,' a work which may fitly be called the first modern attempt to grapple with the problems pertaining to the distribution of plants over the whole globe. For the bulk of Brazil Grisebach recognizes only two regions; his extra-tropical part he includes in his Pampas region. The northern of these two regions, or *Amazon* region, corresponds with the Naiad region of Von Martius; its northern limit runs nearly parallel with and close to the Equator, while in the south-east its boundary includes Ceará, Piauhy, and Maranhão, and is continued westward to the neighbourhood of the Andes, but without anywhere reaching the limit of 10° S. latitude. The rest of tropical Brazil Grisebach unites into one large *Brazilian* region. Engler's * views are somewhat different. He objects to the inclusion in the Amazon region of the dry Piauhy, Ceará, and Maranhão uplands, and he sees no reason why the whole of the country drained by the Amazon and Tocantins rivers and their feeders should not be included in one province †, with which he throws

* 'Versuch einer Entwickelungsgeschichte der Pflanzenwelt.'

† He excludes, of course, the strip of country bordering on the Andes: this constitutes his *Subandine* province.

in Guiana, a country united by Grisebach with Venezuela and parts of Colombia and Central America to form his Cis-Equatorial region. In this way Engler defines a *North-Brazil–Guiana* province. Besides the rest of Brazil, his *South-Brazilian* province comprises Uruguay, Paraguay, the Argentine provinces of Entre Rios and Corrientes, Eastern Bolivia, and the comparatively high-lying country immediately westward of the Chaco. This latter he considers doubtful land, possibly with a predominating Pampas flora. Engler's North-Brazil–Guiana province—taking in, it may also be said, the Venezuelan savannas—thus includes almost the whole of Goyaz, as well as the little-known northern part of Matto Grosso; the southern boundary of this province will be the watershed between the Xingu, Tapajos, and Guaporé rivers to the north and the Paraguay and its feeders to the south. From Drude's* *Amazonas* region the highlands of Guiana are excluded, but all the N.E. of Brazil, including the littoral almost to the 20th parallel, forms part of the region whose southern limit practically coincides with that of Engler's North-Brazil–Guiana province. All the south of Brazil, with Uruguay, Argentina east of the Paraná, the country behind the Chaco, and Eastern Bolivia together make up the *Paraná* region of Drude, which thus largely corresponds with Engler's South-Brazilian province.

There can, I think, be but little doubt that Engler's views are founded upon reason. Bounded on the north-east by the uplands of Maranhão and Piauhy, which, to say nothing of the tract of country lying still further to the east, are scarcely to be considered as having much in common with the moist Amazon forest-zone—in the east and south-east separated from Minas Geraes and Southern Goyaz by several ranges of high hills, such as the Serras do Duro, da Tabatinga, and divisões do Rio Claro,—orographical data are certainly on the side of the Berlin Professor. The weak point in his position consists in the fact that the watershed separating the Paraguay head-waters from those of the Xingu, Tapajos, and Guaporé is a remarkably low one; well, therefore, might the thoughtful student doubt whether that watershed really marks the boundary between the two great provinces, and, as will shortly be shown, the collections which I have just brought back prove such a doubt to be warranted. A few words will first be devoted to the flora of Cuyabá and the Chapada Plateau, after which we will consider the flora of Santa Cruz and, more interesting still, that of the forest-region situated to the north of that settlement.

Flora of Cuyabá and the Chapada Plateau.

The city of Cuyabá lying fifteen and a half degrees south of the line, cursory inspection will convince the reader that it is well within the limits of Engler's South-Brazilian province as of Drude's Paraná region. We should therefore expect its flora—especially the plateau portion thereof—to show much similarity to that of some of the eastern provinces, especially the upland country of Minas Geraes and Southern Goyaz. At the same time the provincial boundary is not very far off, the distance between Cuyabá and the sources of the Arinos being only about a hundred miles. Consequently no surprise should

* 'Die Florenreiche der Erde.' Reprinted from Petermann's 'Mittheilungen,' 1883–84.

be felt at stray plants characteristic of the Amazonian country turning up near Cuyabá ; I did not meet with many such plants, but there is a certain percentage of that element in the flora, as will directly be shown.

For the purpose of this and the following chapters, as also in the systematic portion of the present memoir, I have employed certain geographical expressions which must now be explained. The term " Bras. Or. " is used to denote the whole of the eastern and south-eastern part of the country, from Ceará and Piauhy to Rio Grande do Sul, including Bahia and the neighbouring littoral provinces, Minas Geraes and the southern end of Goyaz. By " Amazonia " I mean the whole of the Amazon and Tocantins basin with the exception of the former's extreme western end, which comes within the Subandine province ; excluding, too, Northern and Central Goyaz, a district in my opinion certainly forming part of the North-Brazil–Guiana province, but kept distinct as tending to show, more satisfactorily than would otherwise be the case, the relations of the Matto Grosso floras to the flora of different portions of the above-named province. For the same reason Guiana—restricted to English, French, and Dutch—receives separate mention. The other districts are political, as it is sometimes extremely difficult if not impossible to discover of what botanical province a given plant is a denizen—a remark of special reference to the north-western parts of the continent.

With a view to making the following statements as wide in their application as possible, I have diligently sought out the affinities of the species considered to be new, entering the result within brackets at the end of each description, but in these cases using italics. On the other hand, the known distribution of a species already described is given in a similar way, but without italics. This method of ascertaining the affinity of a new species, and considering such affinity when found as evidence of phytogeographical value, has much to be said in its favour, especially in the case of one who has exhaustively monographed the genus to which is referable any given plant so dealt with ; though, in less favourable circumstances, explicit reliance upon an author's conclusions can hardly be expected, however laboriously he may have reached them. The only alternative is, when tabulating one's results, to omit all the new species from the calculation, an unsatisfactory method when, as in the present case, a large number of species are new.

Of the flora now to be considered, as of most of the other floras, the chief factor is the Tropical American, consisting, that is to say, of species having a wide range through the American, or at least South-American tropics. No less than thirty-five per cent. of the flora is of this nature *. There is also a large contingent (twenty-six per cent.) of types occurring both in Eastern Brazil and in some part of the North-Brazil–Guiana province. The element next in importance is the East Brazilian (twenty-four per cent.) ; while the North-Brazil–Guiana province is represented to the extent of only ten per cent. Other small elements of the flora are the East-Brazil–Paraguay, the East-Brazil–Goyaz–Paraguay, and the East-Brazil–Amazonia–Paraguay, together making up between two and three per cent. In accordance with Engler's scheme, the first of these should be included in the South-Brazilian flora, and the two latter dealt with in the enumeration of species

* Here and elsewhere decimals are omitted.

common to the two provinces into which the Berlin Professor divides Brazil. Making the requisite modifications in the foregoing statement, the flora of Cuyabá and the Chapada Plateau may be said to be made up of the following factors :—

Diffused Tropical American	35 per cent.
Common to the two Brazilian provinces	28 ,, ,,
South Brazilian	25 ,, ,,
North-Brazil–Guiana	10 ,, ,,

Of this last factor it may be added that—

Types restricted to Amazonia	constitute	40 per cent.
Types restricted to Goyaz	,,	40 ,, ,,
Types of wider distribution	,,	20 ,, ,,

We have already seen the rainfall of Cuyabá to be, for a tropical country, but scanty; moreover, the dry season, while it is of long duration, is very seldom interrupted by storms. The vegetation of the open country, as distinguished from that of the moister valleys, should therefore show some adaptation to xerophilous conditions. The swollen rootstocks, characteristic of many Matto Grosso herbs and small shrubs, are undoubtedly in point here; an examination of the underground parts of trees and the larger shrubs would probably show this adaptation to be very common. Coriaceous leaves also are the rule; and the trunks of trees are often thickly covered with cork, apparently functioning as a hindrance to transpiration. The same end is often served by great diminution in the number of leaves, so that it is by no means unusual to see shrubs perfectly leafless except immediately beneath the inflorescence. The assumption by leaves of a position of least insolation is rarely observed : *Xylopia grandiflora*, A. St.-Hil., which has them vertically pendent, and *Myrcia ambigua*, DC., are the best cases noted by me. Spiny plants do not occur in any great quantity.

Among noteworthy North-Brazil–Guiana species, or species having their nearest affinity with such, may be cited *Banisteria constricta*, Griseb., *Bauhinia cumanensis*, H. B. K., *Inga nobilis*, Willd., and the new species *Guatteria sylvicola*, *Glianthus collinus*, *Ladenbergia chapadensis*, and *Ajouea pruinosa*. Among genera abundantly represented in Eastern Brazil, but here dying down, none is more noteworthy than the Labiate *Hyptis*. Of this genus no less than a hundred and sixteen species are peculiar to the South-Brazilian province, while those endemic in North-Brazil–Guiana number but five, and of the forty-five species common to both provinces only six reach Amazonia. Similar facts may be cited for the genus *Begonia* and others; they might well lead us to suspect, as is actually the case, that at Cuyabá we are near the limits of a botanical province.

Flora of Jangada.

The flora of this place may be taken as representing that of the large district to the north of Cuyabá lying between the Cuyabá and the Paraguay rivers. The various factors of the flora, as shown in my collection, may be stated thus :—

Diffused Tropical American	27 per cent.
Common to the two Brazilian provinces	37 „ „
South Brazilian	24 „ „
North-Brazil–Guiana	8 „ „

Comparing this with the Cuyabá flora, one notes diminution in the Tropical American as also in the North-Brazil–Guiana element, compensated, however, by an increase in the number of types common to the two Brazilian provinces. The South-Brazilian contingent is approximately identical in the case of both floras. One may conclude that the present flora, like that of Cuyabá, is markedly South Brazilian in character, and except for the high percentage of species common to the two Brazilian floras, yields but slight indications of the fact that at Jangada we are in the neighbourhood of another floristic province.

Flora of Santa Cruz and the Neighbourhood.

For the purpose of the following computation, I have included under this head not only the plants found in the open country at and close to Santa Cruz, but also those gathered during our expeditions above that settlement up the rivers Paraguay, dos Bugres, and Brasinho. Since it is highly probable that the two latter flow through the primeval forest at least in the upper part of their course, the plants gathered upon their banks should perhaps have been added to the primeval forest list. It is, however, very difficult, in passing up a river with densely wooded banks, to say how far the thick boscage extends, and whether or no the country soon becomes more open. Mr. Holden, who, at our halting-places, used to push his way through the littoral "matto" in search of sport, is of opinion that, at least in the case of the Paraguay, open campo is soon reached. This, however, can scarcely be correct so far as the Brasinho is concerned; for although in our forest expedition we did not strike this river, yet several of its feeders, such as the San Pedro, Alegra, and Palmitar, were forded, and the banks of these streams showed striking similarity to those of the Brasinho. Moreover, the fact of ipecacuanha being found near the latter river points to the existence of much forest-land there.

The flora is composed of the following items:—

Diffused Tropical American	37 per cent.
Common to the two Brazilian provinces	28 „ „
North-Brazil–Guiana	19 „ „
South Brazilian	13 „ „

If the reader will take the trouble to refer to the Cuyabá figures, he will find the second item precisely the same in both cases, and the first approximately so. The percentage of South-Brazilian types has, however, fallen from twenty-five to thirteen, while the North-Brazil–Guiana percentage, at Cuyabá but ten, is now nineteen; or, speaking roughly, one element has undergone lessening and the other increase to the extent of a hundred per cent.

It may, perhaps, not be wholly uninteresting to show the distribution of the species common to the two provinces, as of those endemic in the North-Brazil–Guiana province.

Of the species common to the two Brazilian provinces we have :—

From Goyaz and Bras. Or.	(or with nearest affinity to such species)	38 per cent.
From Amazonia, Goyaz, and Bras. Or.	" "	23 " "
From Amazonia and Bras. Or.	" "	13 " "
From Goyaz, Bolivia, Peru, Colombia, and Bras. Or.	" "	10 " "
From Goyaz, Guiana, and Bras. Or.	" "	7 " "
From Bolivia and Bras. Or.	" "	4 " "
From Guiana and Bras. Or.	" "	2 " "
From Goyaz, Amer. Cent., Bras. Or.	" "	1 " "
From Goyaz, Paraguay, Bras. Or.	" "	1 " "

Of the North-Brazil–Guiana species there occur :—

In Amazonia and Goyaz	76 per cent.
In Guiana..	13 " "
In Colombia	5 " "
In Peru	3 " "

It must not be forgotten that the inclusion in the Santa Cruz flora of plants found growing on the banks of the Rio dos Bugres and Brasinho tends somewhat to enlarge the North-Brazil–Guiana factor in that flora. In spite of this, one may consider the flora as containing a comparatively large North-Brazil–Guiana element and a smaller South Brazilian. At Santa Cruz, therefore, we have a mixed flora in which North-Brazilian plants somewhat predominate, and the assertion that Santa Cruz ought to be included within the bounds of the North-Brazil–Guiana province will, it is trusted, be deemed in no way unreasonable.

The statement just made may be supported by some additional data. One of the most singular facts in the whole range of phytogeography is the South-American distribution of Cycads, an order which, although in the northern hemisphere reaching to Florida and the Bahamas, is nowhere represented in the eastern part of South America. This is the more remarkable because in the Old World we find Cycads as far north as the thirty-third parallel, while in Australia and at the Cape they almost or quite attain to the thirty-fifth degree of south latitude. Moreover, most of eastern South America is of high geological antiquity, so that *a priori* one would certainly expect to find Cycads there. But whatever be the reason of their absence, the occurrence of a *Zamia* (*Z. Brongniartii*, Wedd.) at Santa Cruz close to the fifty-seventh parallel of longitude is worthy of notice. This species has been found in Eastern Bolivia at St. Xavier (lat. 16° 10′), a place about a degree further south than Santa Cruz, and this, so far as is known, is the southern limit of the order in America. The nearest neighbour of this *Zamia* is *Z. Poeppigiana*, Mart. & Endl., found by Poeppig on the banks of the Tocache river in Eastern Peru, just within the bounds of the Subandine province ; but, as Eichler * observes, it will probably be discovered within the Amazonian region, a region within which no Cycad has yet been met with. But although Cycads are not known from the North-Brazil–Guiana province, as defined by Engler, the occurrence of *Zamia Poeppigiana* near the boundary of that

* Mart. Fl. Bras. iv. pars i. p. 416.

province and of other Cycads further to the north-east, coupled with the entire absence of the order from Eastern South America, justifies us in viewing the existence of a *Zamia* at Santa Cruz as an indication of a North-Brazil–Guiana affinity as distinguished from a South-Brazilian affinity in the Santa Cruz flora.

Negative evidence is also of value in considering the nature of a flora; and although I do not propose to deal with this part of the subject at all exhaustively, a few facts may here be mentioned. I saw no species of *Begonia* at Santa Cruz or in the neighbourhood *. Now, of eighty-three species of *Begonia* enumerated by Alphonse de Candolle in the fourth volume of Martius's 'Flora Brasiliensis,' all are East Brazilian except one Amazonian and one from Matto Grosso. Among Malvaceæ the absence of the genus *Abutilon*—a genus abundantly represented in the South-Brazilian province—is worthy of remark, as is also the paucity of *Compositæ*, which in the same province appear in great force, both generically and specifically. Neither is the rarity of Labiateæ without significance, of which order several genera and many species are endemic in Eastern Brazil: not one of these genera, such as *Cunila*, *Hedeoma*, *Keithia*, *Glechon*, was met with at Santa Cruz. Moreover my collection from Santa Cruz does not contain any representative of such preponderantly South-Brazilian genera of Scrophulariaceæ as *Angelonia*, *Schwenkia*, *Brunfelsia*, or *Stemodia*. The Gesneras, too, are wanting at Santa Cruz; according to Hanstein †, Eastern Brazil claims nearly 80 per cent. of Brazilian species, the localities of the remainder being doubtful. On the other hand the genus *Drymonia*, with head-quarters in Costa Rica, is endemic at Santa Cruz.

The occurrence at Santa Cruz of the new genus *Brosimopsis* is an indication of the affinity of its flora with that of Amazonia, where several small or monotypic genera of Artocarpeæ flourish. *Brosimum Gaudichaudii*, Tréc., however, a characteristic East-Brazilian plant, is also met with at Santa Cruz. Unfortunately most of the orchids there were out of flower during our stay, but the short list of those in flower is very suggestive of the flora's northern affinity. Thus the Amazonian and Guiana *Cattleya superba*, Schomb., flourishes at Santa Cruz, as also do *Epidendrum imatophyllum*, Lindl., a Guiana species, *Notylia bisepala*, S. Moore, of which *N. Huegelii*, Reichb. f., from Mexico, seems the nearest ally, and *Dichæa cornuta*, S. Moore, a species coming nearest to the Guiana *D. graminoides*, Lindl. A curious narrow-leaved *Vanilla*, which, when its flowers are known, will probably prove identical with *V. ensifolia*, Rolfe, from New Granada, should also be noticed. Lastly we have two remarkable grasses: one of these is the lowly *Luziola pusilla*, S. Moore, a species found also in Guiana; the other, a new species of *Pariana* belonging to the section with scapose inflorescences, a section found in Amazonia, but banished from Eastern Brazil.

In addition to those above-named, the following is a short list of some remarkable Amazonian plants, or plants with Amazonian affinity, met with at Santa Cruz and in the neighbourhood:—

* In fact, no species of this large tropical genus was seen by me in Matto Grosso.

† In Martius's 'Flora Brasiliensis,' vol. viii.

Vismia japurensis, Reichardt.
Psidium insulincola, S. Moore.
Passiflora coccinea, Aubl.
Anguria gloriosa, S. Moore.
Randia Ruiziana, DC., var. *longiflora,* K. Schum.
Faramea bracteata, Benth.
Salicea novo-granatensis, K. Schum.
Stilpnopappus viridis, Benth.
Tabernæmontana hirtula, Mart.
Maderosperma oblongum, S. Moore.
Oryctanthus ruficaulis, Eichl.
Croton Cajucara, Benth.
Neea hermaphrodita, S. Moore.
Renealmia Holdeni, S. Moore.

Of the more remarkable Eastern Brazilian plants at Santa Cruz, the subjoined is a short list, viz. :—

Oxalis hirsutissima, Zucc.
Hiræa sepium, A. Juss.
Baccharis tridentata, Vahl.
Rhodocalyx rotundifolius, Muell. Arg.
Brosimum Gaudichaudii, Tréc.
Herreria Salsaparilha, Mart.

But with regard to this list one must remember how little—really almost nothing—is known of the South-Amazonian region. This it is which renders doubtful the exclusion of any of these plants from Amazonia proper.

The Primeval Forest Flora.

It has already been mentioned that the forest extends northward from the immediate neighbourhood of Santa Cruz over a gently undulating upland of low elevation as far as to the Campos de Tapirapuan. In the gloomy recesses of the forest we should expect to meet with a flora different from that of the more open country, so that, instead of the latter's xerophilous vegetation, we ought there to be confronted with hygrophilous types. Moreover, in passing northward through the forest, we are ever approaching the Amazonian plateau. Seeing, therefore, that the North-Brazil–Guiana element is already strongly represented in the flora of Santa Cruz, one would *a fortiori* expect the forest flora to show even more affinity with that of the country lying to the north. My results under this head are somewhat unsatisfactory in consequence of the slender opportunities of collecting afforded me during our expedition through the forest, and the consequent small number of species secured. It is conceivable, however, that a few specimens, plucked hap-hazard may well represent the affinities of a flora ; and in the present case the remarkable series of Amazonian species, and species with Amazonian or rather North-Brazil–Guiana affinity, can scarcely be a false indication as to the nature of the flora as a whole.

In this flora we find a large preponderance of North-Brazil–Guiana types, and, as compared with the Cuyabá and Santa Cruz floras, marked decrease in the diffused Tropical American and East Brazilian factors, as the following figures show :—

The constituents of the forest flora are

Diffused Tropical American	28 per cent.
North-Brazil–Guiana	47 „ „
Common to the two Brazilian provinces	9 „ „
South Brazilian	9 „ „
Mexican	4 „ „

The reader will also notice here the extremely small contingent of species common to the two Brazilian provinces; so that while at Cuyabá no less than eighty-eight per cent., and even at Santa Cruz seventy-eight per cent., of the vegetation consists of species one might expect to find anywhere in Eastern Brazil, or of plants most nearly related to such species, this element of the forest flora amounts to no more than forty-six per cent., the proportion of species endemic in regions outside Eastern Brazil being at Cuyabá seventy-three, at Santa Cruz eighty-four, and in the forest eighty-eight per cent.

Here is appended a short list of some forest plants with Amazonian distribution or Amazonian affinity; the distribution or affinity is shown within brackets:—

Guarea sylvestris, S. Moore. (Near the N.-Brazil–Guiana *G. paraensis*, C.DC.)
Pithecolobium stipulare, Benth. (N.-Brazil–Guiana.)
Bertiera guianensis, Aubl. (N.-Brazil–Guiana, West Indies.)
Psychotria triphylla, Muell. Arg. (N.-Brazil–Guiana.)
Psychotria homoplastica, S. Moore. (Near *P. lupulina*, Benth., from Amazonia.)
Bletia catenulata, Ruiz & Pav. (Guiana, Peru.)
Rodriguezia secunda, H. B. K. (N.-Brazil–Guiana, Central America, West Indies.)
Anthurium gracile, Lindl. (N.-Brazil–Guiana, Central America, Trinidad.)
Anthurium sylvestre, S. Moore. (Near *A. Martini*, Schott, from Guiana.)
Hypolytrum longifolium, Nees. (N.-Brazil–Guiana, Trinidad.)

My notes contain no record of the finding in the forest of a single plant restricted to the South-Brazilian province, and there are only four with exclusive South-Brazilian affinity; these are the new species *Herpestis parvula*, *Solanum saltiense*, *Dalechampia sylvestris*, and *Ischnosiphon nemorosus*.

The smallness of the collection gives one but slight opportunity to study the ordinal peculiarities of this flora. It may, however, be stated that the Rubiaceæ, Orchids, and Aroids show decided affinity with those of the North-Brazil–Guiana province. Moreover, one meets with *Zamia Brongniartii*, Wedd., on the Tapirapuan campos. *The foregoing facts, it is submitted, force upon one the conclusion that, unless the evidence yielded by my collection be deceptive, the forest-region, although lying well within the Paraguay Valley, must be included within the bounds of the North-Brazil–Guiana, and not, as would naturally be supposed, within those of the South-Brazilian province.*

Flora of Corumbá and Coimbrá.

Corumbá is situated close to the ninteenth parallel of south latitude, and Coimbrá still further south. The extreme northern end of the Gran Chaco being not far off, one might expect to find, in the flora now to be considered, indications of the proximity of a region of comparative drought; and this, as will soon appear, is to some extent the case. The climate of Corumbá is much like that of Cuyabá, but I do not know what is its annual rainfall. To judge from our own experience, we having spent six weeks here in the middle of the wet season, the rainfall is probably less than at Cuyabá. Throughout those weeks I do not remember a single day during at least some part of which botanizing was impracticable; and although the district was occasionally visited by violent storms, bright sunshine followed by a brilliant sunset was the general rule—

weather which could scarcely have been exceptional, as I was informed by an intelligent old inhabitant, who expressed no surprise at the absence of rain, that Corumbá is a "dry place."

The flora of this southern part of Matto Grosso is made up of the following factors:—

Diffused Tropical American	42 per cent.
South Brazilian	34 ,, ,,
Common to the two Brazilian provinces	15 ,, ,,
North-Brazil–Guiana	5 ,, ,,

The relatively large number of diffused species will be noticed, as also the great decrease in the proportion of types common to the two provinces. The South-Brazilian contingent appears in great force, and the North-Brazil–Guiana is correspondingly diminished. The South-Brazilian factor is composed as under:—

Bras. Or.	54 per cent.
Paraguay (extending into Argentina)	27 ,, ,,
Bras. Or., Paraguay, Uruguay	18 ,, ,,

And the common element thus:—

N.-Brazil–Guiana and Bras. Or.	63 per cent.
N.-Brazil–Guiana, Bras. Or., and Paraguay	26 ,, ,,
N.-Brazil–Guiana, Paraguay, and Argentina	10 ,, ,,

Amazonian species, or species with Amazonian affinity, met with in the district under notice are:—

Corynostylis pubescens, S. Moore. (This genus is not found in East Brazil, neither did I come across it further to the north.)
Centrosema vexillatum, Benth. (A North-Brazil–Guiana plant.)
Teramnus volubilis, Sw. (Amazonia, Colombia, Central America, West Indies.)
Tephrosia brevipes, Benth. (Guiana, Colombia, Porto Rico.)
Pterocarpus Rohrii. (N.-Brazil–Guiana.)
Pacourina edulis, Aubl. (N.-Brazil–Guiana, Colombia, recently found in Paraguay.)
Macfadyenia laurifolia, Miers. (Venezuela.)

The Argentine and Paraguayan element is illustrated by such types as:—

Stigmaphyllon calcaratum, N. E. Br.
Thinouia sepium, S. Moore.
Paullinia angusta, N. E. Br.
Zizyphus oblongifolius, S. Moore.
Pereskia Bleo, DC.
Thevetia bicornuta, Muell. Arg.
Tabebuia Avellanedæ, Lorentz.
Coccoloba sarmentosa, S. Moore.
Ficus Elliottiana, S. Moore.
Tillandsia streptocarpa, Baker.

Adaptations to xerophilous conditions in the form of swollen rootstocks, leathery leaves, and stems invested in a thick clothing of cork are frequently met with in this region. Several of the genera, such as *Cereus*, *Pereskia*, and *Talinum*, have fleshy leaves or stems. Another interesting xerophilous plant is the new *Zizyphus oblongifolius*; this has the narrow leaves characteristic of species endemic in warm or temperate climates, and in habit is quite different from tropical species with their reduced spines and large leaves; in fact, the plant is closely allied to one from the dry Argentine country.

Remarks on the probable Origin of the Foregoing Floras.

It will scarcely be disputed that the whole of Eastern and Central Brazil has, in times past, been a great area of evolution and of dispersal. Indeed, the large number of peculiar genera endemic there—genera, many of them, monotypic or oligotypic—the wide distribution of many of the species, and the high geological antiquity of this part of South America are all evidence in favour of the proposition. To the student of phytogeography the question of interest here raised is, by what means was dispersal effected? Doubtless the movements of quadrupeds and of birds, wind, dust-storms, &c. have played their part in South America as elsewhere, but I cannot help thinking another and even more effectual means to have been brought into operation. A glance at the map of Brazil will show that the country has two large water-sheds—an eastern, dividing the waters of the São Francisco and Parahyba on the east and north-east from those of the Tocantins on the west; and a western, running more or less east and west, interposed between the numerous feeders of the Araguaya, Xingu, Tapajos, and Guaporé flowing northward and westward, and those of the Paraguay with a southward flow. When these rivers are in flood many fruits and seeds must certainly be carried down to the lower country; consequently in the disposition of these water-sheds we can see means for ensuring, firstly, wide disposal of species through Eastern Brazil, and secondly dispersal of Central Brazilian types northward to Amazonia, and southward to the country watered by the Paraguay and its feeders, such as the Cuyabá, Sipotuba, Cabaçal, and Jauru rivers. Moreover, from the São Francisco–Tocantins water-shed may well have been derived species whose distribution is Northern Goyaz and Eastern Brazil; and this may be offered as a plausible explanation of the considerable resemblance there is between the floras of Minas Geraes and Northern Goyaz, although the two districts fall within the bounds of different phytogeographical provinces. Further, the large percentage of diffused Tropical American types in the floras already dealt with receives a simple elucidation from the fluvial geography of Brazil. The density of the vegetation upon the river-banks and its comparative sparseness elsewhere have already been mentioned; this fact must obviously enhance the importance of the rivers as distributing agents. One may here refer to the occurrence at Corumbá, as far south as the nineteenth parallel, of several Amazonian plants not found in any immediate station, and, in spite of the strongly South-Brazilian character of the Corumbá flora, quite unknown in the eastern part of the country. What hypothesis sounder than that here advocated can possibly be put forward to account for this?

But, besides this north and south distribution, there are clear indications as to the range of many species of the Matto Grosso flora being dependent upon latitude. This fact will be made clear to the reader on cursory examination of the distribution of species given in the following pages. He will see that a considerable percentage of East-Brazilian types pass through Matto Grosso to Eastern Bolivia, but do not occur to the northward. Similarity in the matter of rainfall is probably the reason of this, there being a marked difference in that respect between South and North Brazil, and marked agreement between the eastern provinces and Matto Grosso.

I have already shown how greatly the flora of the primeval forest lying between Santa Cruz and Tapirapuan differs from that of the open country extending to the eastern bank of the Paraguay river. That such diversity should exist is not difficult to understand. The flora of the open country behind the forest (Campos de Tapirapuan), so far as my rapid visit enables me to judge, does not show much affinity to that of the district round Santa Cruz, although external features are the same in both districts. The interposition of a wide tract of forest land is undoubtedly answerable for this diversity. In the forest peculiar conditions of light, heat, and moisture prevail—conditions unfavourable to most plants adapted to the drier, hotter, and sunnier open country. We may, therefore, regard the forest as a dense barrier impenetrable from either side. Winged, bladdery, and pappose seeds and fruits might occasionally be conveyed by winds across this barrier, but this would not be likely to happen often if the strip of forest were broad. Berries and drupes, too, would not be distributed by birds, seeing how different is the bird-fauna of the forest on the one hand and of open land on the other, and for analogous reasons hooked fruits would be little likely to penetrate far. On the whole, then, so slight are the means of communication between two open regions separated by a broad strip of dense forest, that it would probably not be incorrect to infer more floristic dissimilarity under these circumstances than if we had to do with an equal breadth of water. Similarly, shade-loving forest plants would only occasionally be transported across extensive intervening dry districts freely exposed to the ardours of a tropical sun; and this obvious consideration leads one to believe that almost continuous forest must extend from the Upper Amazonian basin to that of the Upper Paraguay, most probably *viâ* the Guaporé river.

Lastly, a quickly flowing river like the Paraguay at and near Santa Cruz must, in some degree, tend to keep neighbouring floras distinct. Plants with edible fruits would indeed be disseminated by birds; but ordinary fruits and seeds, and often also those provided with wings or a pappus, &c., would fall into the water to be hurried away down stream. At Santa Cruz I was prevented by indisposition from paying much attention to the eastern bank of the river, but what little I saw of its flora pointed to decided floristic difference between the two river-banks, difference which, at the time, seemed to me accountable only in the way just mentioned. Further observations, however, may prove this impression to be unsupported by facts.

The collection has been worked up partly at the British Museum, partly at Kew. At the former institution the Brazilian flora is illustrated by sets of Gardner, Spruce, Pohl, Blanchet, Sello, Pœppig, Von Martius, Bowie and Cunningham, Weir, Claussen, Widgren, de Mello, and Messrs. Ridley, Lea, and Ramage. Kew, with most of the above sets, boasts the splendid results of the intrepid Burchell's wanderings in the eastern part of the country.* A fine set of Riedel's plants, a collection but poorly represented at the Museum, is also preserved at Kew; so, too, are Professor Trail's Amazon specimens, and a set of the very large and remarkable collections made by that enterprising veteran,

* One cannot but regret that much of the 'Flora Brasiliensis' should have been written without examination of British herbaria, especially the two under notice. For this reason, many nondescripts, chiefly of Gardner's and Burchell's collecting, exist in this country.

M. Glagiou. Moreover, a number of A. St.-Hilaire's types have recently been presented to the Thames-side institution. I take this opportunity of expressing my conviction that, when one remembers the comparatively small amount of attention devoted by Britishers to the Brazilian flora as contrasted with their energy elsewhere, one has every reason to be proud of both our National Herbaria, which, although probably not so rich in plants of Brazil as the kindred establishments at Berlin and Paris, do certainly afford help quite invaluable to the student.

It were to shirk a pleasant duty to end this introduction without recognition of kindness received from many quarters in the course of my work. Thanks are especially due to Mr. Carruthers, who allowed the plants to be stored at and distributed from the British Museum, and who, in every other possible way, has furthered my labours. Mr. Carruthers also examined and confirmed my determination in respect of the only Cycad in the collection. The other members of the Museum botanical staff have, each in his special department, most obligingly permitted me to take advantage of their knowledge. I am indebted to the Officers of the Linnean Society for kindly seeing the proofs of this memoir through the press in my absence from England. All my friends at Kew without exception, from Mr. Baker downwards, were ready with help in cases of difficulty; and more than once, when thoroughly beaten owing to the imperfect state of a specimen, I was put upon the right track by Professor Oliver. Mr. C. B. Clarke very kindly undertook the Cyperaceæ, an order upon which he has bestowed an immense amount of time and trouble; Commelynaceæ also were determined by the same botanist. Mr. Scott Elliott looked at the Figs, and indicated the novelty and affinity of one of these. Mr. Daydon Jackson allowed me to consult advance sheets and MSS. relating to his great "Index Kewensis," and this saved me much trouble, and prevented some errors. Nor must I omit the names of several foreign botanists, who were good enough to examine and compare certain specimens and send information on critical points; the list is, I believe, exhausted on mentioning the following:—Professors Engler and Radlkofer, Drs. Schumann and Taubert, of Berlin, Dr. Warburg, and the late Dr. Morong. To these gentlemen my best thanks are here recorded.

To Lieut. Olaf Storm and Mr. John Storm I am greatly obliged for doing all in their power to further my work in every possible way, and also for allowing me to make use of the map accompanying this memoir. Dr. Evans, Mr. Holden, and the other members of the expedition rendered me much kind assistance, which I here gratefully acknowledge.

I have also to acknowledge indebtedness to the Royal Meteorological Society, through their courteous Assistant Secretary, Mr. William Marriott, for the opportunity of access to records relating to the climate of Brazil. Nor should the great pains taken by Mr. R. Morgan with the plants figured be left unmentioned.

Of the plants, the first set, with notes, &c., goes to the British Museum, the second set to Berlin, and the third to Columbia College, New York; Vienna has the fourth, and Kew the fifth. Small sets have also been sent to Paris, Rio de Janeiro, and Edinburgh.

Systematic Portion.

DIALYPETALÆ.

THALAMIFLORÆ.

DILLENIACEÆ.

Davilla lucida, Presl, Reliq. Hænk. ii. p. 73.
Hab. Crescit in cacumine montium Serra da Chapada, ubi mens. Aug. floret. (N. 109.) [Amer. Trop., Ind. Occ.]

Davilla lacunosa, Mart. in Flora, xxi. (1838), II. Beibl. p. 49.
Hab. Matto Grosso (*Leeson* (n. 7) in Herb. Brit. Mus.). [Bras. Or.]

Curatella americana, L. Syst. ed. X. 1079; Sp. Pl. ed. II. 748.
Hab. Reperi inter Cuyabá et Serra da Chapada mens. Aug. florentem, itaque ad Santa Cruz, ubi *Licha* nuncupatur. (Nn. 54, 423 *a*.) [Amer. Trop., Ind. Occ.]

Doliocarpus dentosus, Mart. in Flora, xxiv. (1841), II. Beibl. p. 65.
Hab. Ad Santa Cruz flores præbet mens. Nov. (N. 535.) [Bras. Or.]

ANONACEÆ.

Ephedranthus, e tribu Uvariearum gen. nov.

(Plate XXI.)

Flores actinomorphi. Sepala 3, æstivatione valvata. Petala 6, libera, biseriata, omnia superne imbricata, inferne aperta, subæqualia, erecto-patentia. Stamina indefinita, dense pluriseriatim imbricata, cuneata, a dorso compressa; connectivus sursum dilatatus, incrassatus, truncatus; antheræ extrorsæ. Torus hemisphæricus. Frutex diffusus, ramosus. Folia disticha, penninervia. Flores pusilli, unisexuales (an dioici?), feminei ignoti, masculi extus sericeo-tomentosi, in axillis foliorum solitarii, brevissime pedunculati; pedunculi bracteis latis 3-seriatis distichis, arcte imbricatis, alabastra obtegentibus onusti. Carpella et baccæ ignotæ.

Ephedranthus parviflorus, S. Moore; ramulis teretibus pubescentibus, demum subobsolete puberulis; foliis breviter petiolatis, ovato-lanceolatis vel obovato-oblongis, obtusis acutisve, interdum breviter cuspidatis, basi gradatim angustatis ibique subrotundatis, rarius levissime cordatis, tenuiter coriaceis, supra glabris, subtus, præsertim in nervis, appresse pubescentibus, dein glabris; costis secundariis utroque latere 6–9, adjectis pluribus tertii ordinis, angulis variis, plerumque vero latis, insertis, primo nunc leviter, nunc levissime arcuatis, deinde undulatim-fornicatim-conjunctis, supra impressis, subtus eminentibus; pedicellis ferrugineo-tomentosis, bracteis absconditis; bracteis rotundatis vel rotundato-ovatis, obtusis obtusissimisve, extus ferrugineo-sericeis, intus levibus, puberulis; sepalis rotundato-ovatis, obtusis; petalis sepala paullo excedentibus, sericeo-tomentosis, exterioribus ovato-oblongis, quam interiora

oblonga paullulum brevioribus, omnibus obtusis; staminibus circa 8-seriatis parvis, subsessilibus, antherarum loculis basi obliquis.

Hab. Crescit in sylvulis juxta Santa Cruz, ubi flores præbet mens. Sept. (N. 310.)

Ramuli usque 0·4 cm. diam., ultimi vero vix 0·1 cm., fusco-grisei, longitrorsum rimosi, minute lenticelliferi. Folia 5·5–11·0 cm. long., 2·0–4·5 cm. lat., supra vix nitidula, subtus paullo pallidiora. Pedunculi 0·2 cm. long. Bracteæ basi late insertæ, infimæ exiguæ, superiores majores, illæ equidem 0·08 cm. long., intermediæ infimas plus quam duplo excedentes, summæ 0·35 cm. long., omnes coriaceæ. Flores circa 0·8 cm. diam., dilute virides. Sepala vix 0·4 cm. long., 0·37 cm. lat., coriacea, extus ferrugineo-sericea, intus appresse puberula et saltem in sicco castanea. Petala submembranacea, exteriora 0·5 cm. longa, omnia intus plus minus puberula. Torus 0·1 cm. alt. Stamina modo 0·07 cm. long.; antherarum loculi 0·04 cm. long.

Genus verisimiliter juxta *Guatteriam* interponendum, abs quâ optime abhorret floribus unisexualibus parvulis subsessilibus bracteis obtectis, petalis omnibus manifeste imbricatis nec unquam subvalvatis, et toro hemisphærico.

This plant, on account of its æstivation and the structure of its andrœcium, is undoubtedly to be referred to the tribe Uvariæ. Probably it will come nearest to *Guatteria*, but this will depend on the nature of the placentation. Should the carpels prove to be many-ovulate, *Ephedranthus* will have to be placed in the neighbourhood of the East Indian *Sageræa* and *Stelechocarpus*, the former of which may have unisexual flowers, while the latter is diœcious.

I have examined all the flowers it was possible to sacrifice, in order to ascertain whether carpels are present, but in no case could a trace of one be found. The flowers, therefore, if they be not diœcious, are at least unisexual; for myself I strongly incline to the former supposition. Upon either view, the genus would be markedly different, exclusive of other characters, from *Guatteria*, the flowers of which are always hermaphrodite.

Here follow a few notes upon various points of interest possessed by the plant:—

The stem * (Plate XXXVIII. fig. 1) is in no way abnormal as respects its structure. The protoxylem is situated at the extremity of each mass of xylem, which projects some distance into the pith; in its immediate neighbourhood are a number of small fibres and tracheïdes, and these latter are succeeded further outwards by pitted tracheïdes and fibres of ordinary appearance; the xylem parenchyme, which is comparatively rare, shows a tendency to arrange itself in tangential lines. The soft bast is normal, while the hard bast in each phloem region is composed of two or three masses of fibres, of which the outermost has the greatest thickness. These masses frequently run right across and so stop up the medullary rays. There is a narrow pericycle; it is bounded externally by a layer, in some places double, of thick-walled cells forming a well-marked endoderm. The cortex, especially its outer portion, is strengthened by means of frequent thick-walled sclerotic parenchyme cells, a little way outside which, and close to the epiderm, is the phellogen

* Here and elsewhere in this part of my report on the botany of our expedition only a few of the more obvious facts of structure have been recorded.

layer. The medullary rays vary considerably in width; like the cells of the comparatively small pith-region, they are filled with spherical or elliptical simple or more usually compound starch-grains, varying greatly in size, the largest being usually found in the pith.

The leaves are inserted on a strictly distichous plan, but material for the study of the arrangements of the leaf-traces is not available. The one point worthy of mention *à propos* of the leaf-structure is that the stereome protecting the vascular bundles runs right up to the epiderm, which latter tissue, where it overlies the bundles, is composed of smaller cells than usual, and of cells often with somewhat thicker walls than elsewhere; in other words, the epiderm itself can to a certain extent assume the appearance of stereome, and this arrangement must obviously give great strength to the leaf. Beneath the midrib, however (that is, on the lower side of the leaf), parenchyme intervenes between the stereome and the epiderm (fig. 3). Fig. 2 shows the upper surface of the leaf seen from above; over the palisade tissue the epiderm cells are larger and have the wavy borders so frequently possessed by epiderm; but the cells lying over the vascular bundles are shorter and more angular, and usually, though not quite always, each of them contains a single rhomboidal crystal. The leaves are bifacial in the most marked degree, there being no stomates on the upper surface; each stomate is accompanied by two subsidiary cells, often very unequal in size (fig. 4). Near the vascular bundles the mesophyll seems to be continuous, without any intercellular spaces; further away, however, it becomes "spongy." Many Anonaceæ have glandular leaves, and *Ephedranthus* is no exception to this, as sections show several glands immersed in the lower part of the mesophyll. These glands are similar in appearance to those of *Stormia*, shown in fig. 7 of Plate XXXVIII.

Like the leaves, the three series of bracts are strictly distichous. In the case of one flower, however, which I examined, the sixth bract did not stand exactly over the fourth, but had been deflected to a trifling extent towards one side, probably as a result of abnormal pressure in the bud. In the diagram (Plate XXXVIII. fig. 5) it will be seen that the position of the axis is not indicated; this I have not been able to ascertain, owing to want of material.

The small pollen-grains are ellipsoidal in shape, and, except for a few fine striations, are quite smooth. I could make out two pores, but never more.

Guatteria sylvicola (sp. nov.); caule subtereti, leviter undulato, nigrescenti-purpurascente rufo-tomentoso, dein pubescente, demum glabro; foliis maxime inæqualibus, subsessilibus, elongatis, anguste oblongo-obovatis, cuspidatis, obtusis, basi cuneatim angustatis, coriaceis, supra fere glabris, subtus, præsertim secus nervos, rufo-tomentellis; pedunculis solitariis, foliis longioribus, prope basin articulatis, indumento rufo-villoso-tomentoso instructis; bracteis minutis; sepalis late ovatis, basi paullo cordatis, obtusiusculis; petalis obovato-oblongis, obtusis vel retusis vel brevissime bilobis, sepala duplo excedentibus; staminibus late linearibus obtusissimis; baccis ignotis.

Hab. In sylvis ad Serra da Chapada, alt. circiter 2000 ped. supra mare. Fl. Aug. (N. 142.)

Folia 10·0–27·0 cm. long., medio 3·5–8·0 cm. lat. Arbuscula habitu fruticis elati. Caulis undulatus, demum reticulato-insculptus, 0·4 cm. diam., margine undulato; costæ secundariæ utrovis latere 15–20, adjectis paucis tertii ordinis, angulis latis alternatim insertis, raro suboppositæ, rectæ, infra marginem subito fornicatim conjunctæ, costis pag. sup. eminentibus, nervis laxe recticulatis, parum prominulis; petiolus 0·5 cm. long., incrassatus, late canaliculatus, rufo-tomentosus. Bracteæ ovatæ, acutæ, tomentosæ, 0·2 cm. long. Pedunculi 1·0–1·5 cm. long., erecti. Sepala et petala crassa, illa extus rufo-tomentosa, 0·8 cm. long. et lat., hæc 1·5 cm. long., apice vix 1·0 cm. lat., paullo supra basin ad 0·6 cm. angustata, juxta basin rufo-, superne cinereo-tomentosa. Torus stamineus 0·14 cm. alt. Stamina 6-seriata, circiter 0·12 cm. long. Gynæcium 0·3 cm. diam., 0·22 cm. alt., medio levissime elevatum; carpella tetragona, rufo-tomentosa, cum stigmate prominulo 0·2 cm. longo.

Videtur prope *G. Ouregou*, Dun., ponenda, sed diversa, præter alia, ob folia majora et comparate angustiora, basi cuneatim angustata, pedunculos solitarios foliis breviores, &c. [*Amazonia.*]

Duguetia furfuracea, Benth. & Hook. f. Gen. Pl. i. p. 24.

Hab. Crescit in cacumine montium Serra da Chapada, ubi fructificantem habui mens. Aug. (N. 163.) [Bras. Or.]

Duguetia Sanctæ-crucis (sp. nov.); caule tereti, in sicco rimoso, leviter furfuraceo, deinde fere glabro et suffuscente; foliis coriaceis, breviter petiolatis, elongatis, lanceolatis, obtusis, acutis, vel cuspidato-acuminatis, supra nitentibus, subtus arctissime furfuraceo-tomentosis, nervis subtus eminentibus; pedunculis solitariis, erectis, petiolos longe excedentibus, juxta medium articulatis; bracteis parvis, rotundatis, obtusis; ovariis linearibus, apice in stylum gracilem rectum vel incurvum et ovario duplo breviorem desinentibus; carpidiis (vix maturis) obovoideo-oblongis, angularibus, sericeo-fusco-tomentosis, basi aspermis, rostro recto vel plerumque incurvo coronatis.

Hab. Crescit in sylvaticis ad Santa Cruz, mens. Nov. florens. (N. 576.)

Arbor parvus, circa 6 met. alt., habitu fruticoso. Caulis ascendens, sat crebro ramosus. Petiolus 0·4–0·5 cm. long., sulcatus, incrassatus, arcte annulatim striatus, furfuraceo-tomentellus; lamina 9·0–21·0 cm. long., 2·5–5·2 cm. lat., basi angustata vel levissime rotundata, utrinque reticulato-nervosa; costæ secundariæ utrovis latere 12–16, adjectis paucis tertii ordinis, angulis variis latis insertæ, primo rectæ vel undulatæ, dein dichotome fractæ et antrorsum et retrorsum arcuatim porrectæ, nunc simpliciter ac magnopere arcuatæ. Bracteæ circa 0·5 cm. long., amplexicaules. Pedunculi 2·0 cm. (sub fructu attamen 3·5 cm.) longi, superne leviter incrassati, furfuraceo-tomentosi. Sepala, petala, et stamina desunt. Torus stamineus 0·15 cm. alt. Gynæcium 0·45 cm. diam. Ovaria 0·22 cm. long., dorso compressa. Fructus immaturus fere 2·5 cm. diam. Carpidium basi carinatum 0·6–1·0 cm. long., basis asperma compressa, 0·2–0·6 cm. long.; rostrum 0·1–0·2 cm. long., subulatum, dorso compressum.

Species propria ob pedunculos bracteatos forsan ad *D. bracteosam*, Mart., accedens, ab ea vero affatim distat. [Bras. Or.]

STORMIA, e tribu Unonearum gen. nov.

(Plate XXII.)

Flores actinomorphi, hermaphroditi. Sepala 3, reduplicato-valvata, crasse coriacea. Petala 6, biseriata, æstivatione valvata, in corollam gamopetalam inferne connata, interiora quam exteriora paullo minora, exteriora a calyce paullulum superata. Stamina ∞, pluiseriata, arcte imbricata, anguste cuneata, connectivo apice truncato-dilatato, loculis transverse rugatis, uniseriatim plurilocularibus, extrorsis. Torus parum elevatus, apice late truncatus. Carpella 14–21, sessilia, circa 7-ovulata, stylo infundibulari majusculo incrassato elongato integro coronata; ovula sub-1-seriata, anatropa. Baccæ (ex St.-Hil. & Tul.) "septis spuriis transversim multiloculares." Frutex altus, vel potius arbuscula. Folia breviter petiolata, costis secundariis plurimis percursa. Flores mediocres, solitarii, pedunculis exaxillaribus insidentes. Receptaculum dilatatum, laminatum, paullo ultra sepalorum insertionem annulatim productum.

STORMIA BRASILIENSIS, S. Moore.—*Hexalobus brasiliensis*, A. St.-Hil. & Tul. in Ann. Sc. Nat. sér. II. xvii. p. 133.—*Trigyneia brasiliensis*, Benth. & Hook. f. Gen. Pl. i. p. 24.—*Unona brasiliensis*, Baill. Adansonia, viii. p. 305. Stirps fere 4-metralis, ramosa. Rami abundanter foliati, subteretes, arcte tomentelli, nunc pubescentes, deinde fere glabri et rimis anguste ellipticis notati, fusci. Folia oblongo-lanceolata vel oblocu-lato-oblonga, breviter cuspidata, obtusa, raro obtusissima vel emarginata vel retusa, basi sæpissime paullo obliqua angustata vel subrotundata, cito costâ mediâ appresse tomentellâ exemptâ glabra, nitida; costæ secundariæ utrinque 15–20, angulis fere rectis paullulum decurrentim insertæ, juxta marginem subito arcuatim-undulatim conjunctæ, utrinque prominulæ; venulæ laxe reticulatæ, utrinque eminentes. Petioli circa 1·0 cm. long., aliquatenus complanati, tomentelli. Pedunculi circa 1·0 cm. long., plerumque plus minus decurvi, arcte albido-sericei. Flores pallide virides. Alabastra trigona, paullulum ante floritionem circa 1·0 cm. diam. Sepala ovata, obtusa, extus albido-sericeo intus tomento dilute ochraceo munita, 1·2 cm. long., 0·8 cm. lat. Petala ovata, obtusa, interdum inæqualia; lamina libera, basi leviter cordata, albido-sericea, intus in sicco fusca. Receptaculum 0·4 cm. diam., aliquanto triangulare. Torus circa 0·15 cm. alt., apice 0·25 cm. diam. Stamina 0·3 cm. long.; filamenta brevissima; connectivus sursum gradatim amplificatus, apice parum incrassatus. Carpella linearia, albo-sericea, arcte conferta, 0·2 cm. long.; styli ovarium semiæquantes, apice pilis stigmatosis instructi. Baccæ non suppetebant.

Hab. Ad Santa Cruz, floret mens. Nov. (N. 523.)

Genus ad *Unonam*, necnon ad *Asiminam*, spectans. Ab illâ attamen divergit imprimis receptaculo dilatato, petalis parvis connatis, et staminibus rugatis; hæc, contra, receptaculo normali, petalis liberis, toro subgloboso, staminibus et stigmatibus disparibus, ovulis biseriatis gaudet. Cum *Trigyneiâ*, cujus flores pusilli, receptaculum haud

dilatatum, et petala libera, et carpella indefinita, certe non congenerica. *Hexalobus* tametsi petala basi connata, itaque flores parvos, receptaculum normale, stigmata bipartita, carpella pluriovulata plerumque biseriata præbet.

Undoubtedly the most noteworthy feature about *Stormia* is the curious dilated receptacle. On turning the flower upside down this appears as a membranous obscurely triangular expansion of the top of the peduncle, the sepals being inserted well within its free rim. In this respect *Stormia* holds to other Anonaceæ the position of *Eschscholtzia* to normal Papaveraceæ, but the comparison must not be carried too far, as there is not the least sign, in the Anonaceæ, of that perigyny which is so remarkable a feature in *Eschscholtzia*. Curiously enough, authors have completely overlooked this dilatation of the receptacle, although it is somewhat obscurely figured by St.-Hilaire and Tulasne. The Australian *Eupomatia*, it may be observed, also has a dilated receptacle; but, inasmuch as the carpels are immersed in it, no valid comparison of that genus with *Stormia* is possible. I cannot endorse Prof. Baillon's remarks ('Adansonia' viii. p. 306):—"MM. Bentham et Hooker ont très-sagement rapporté au genre *Trigyneia* l'*Hexalobus brasiliensis*, A. St.-Hil. et Tul." Baillon's views are very original, and if they were accepted the genera of Anonaceæ would be greatly reduced in number. Thus, he sinks not only *Trigyneia*, but *Melodorum* and *Cananga* also in *Unona*, a genus which he regards as embracing no less than fifteen sections, all founded on genera of former authors. Moreover, Baillon, speaking of our plant, says ('Histoire des Plantes,' i. p. 212):—"Sauf l'union de ses pétales, cette espèce est très-voisine de notre *Unona Oliveriana*;" and this leads one to doubt whether the Paris Professor could have examined the Brazilian type.

The structure of the curious corrugated anthers of *Stormia* is alluded to further on. It must suffice here to point out their resemblance to those of that singular genus *Hornschuchia* of Nees von Esenbeck. This genus Nees at first referred to Sapotaceæ, soon removing it to Olacineæ, and afterwards to Sapindaceæ. Endlicher placed it doubtfully at the end of Ebenaceæ; Lindley, also with doubt, among the Sapindaceæ; Meissner considered it to be a Sapotacea, while Miquel, after thorough examination, suggested an entirely new affinity, viz., with Lardizabaleæ. In the 'Genera Plantarum,' on the other hand, Bentham and Hooker express their belief in its being Anonaceous. Here is disagreement among the doctors indeed! The description of the flower is briefly as follows:—There is a deep cup-shaped outer organ, presumed to be a calyx; the petals are 6, biseriate and valvate in æstivation; 6 stamens are inserted on a slightly raised torus, and the anther-cells are transversely corrugated, and divided each into a longitudinal series of chambers; the pollen is compressed. There are three free carpels, each with 4 or 5 uniseriate anatropous ovules, and each crowned with a small stigma. The fruit is a berry, to some extent spuriously septated; the ripe seed, unfortunately, is not known.

Were the receptacle of *Stormia* to become deepened, we should get something like the calyx of *Hornschuchia*. But I suppose the latter organ must be a true calyx; otherwise, on the hypothesis of affinity between *Hornschuchia* and *Stormia*, what has become of one of the three outer whorls of its floral leaves? The paucity in stamens, when contrasted with *Stormia's* multiple andrœcium, is a striking point of difference between the two genera; this, however, seems over-ridden by the remarkable septation of the anther-cells in both.

The pollen of *Hornschuchia* takes the form of large multicellular masses; that of *Stormia*, though often consisting of single grains, is frequently found, even when obtained from anthers apparently adult, to be more or less aggregated owing to persistence of the special anther-cell's walls (Plate XXXVIII. fig. 12). Except for the number of its carpels, the gynæcium of *Hornschuchia* well stands comparison with that of *Stormia*, and the septation of the berry is another point of agreement. Bearing all these facts in mind, I certainly think the above-stated view of Bentham and Hooker to be that one for which there seems to be the most warrant.

In the structure of its stem (Plate XXXVIII. fig. 5) *Stormia* presents no point of special interest. There is a relatively reduced pith, of which the cells are filled with small spheroidal or ellipsoidal starch-grains, sometimes simple, sometimes compound. In the xylem there are numerous (about twenty) masses of protoxylem, and tracheïdes are fairly abundant. Fibres of normal appearance make up most of the remaining part of the xylem, parenchyme-cells being rare. In the phloem the fibres, parenchyme, and small sieve-tubes with companion-cells are in every respect normal. The sections made by me showed usually four groups of bast-fibres; of these the three inner have their long axes tangential, the outer group being elongated in a radial plane. There is a well-marked endoderm. The medullary rays, one, two, or three cells thick in the xylem, become widened on passing into the phloem, and are here sometimes strengthened by single or aggregated sclerotic parenchyme elements; similar elements are also to be seen in both cortex and pith. The phellogen layer lies close to the epiderm.

The venation of the leaf is peculiar and reminds one more of a *Clusia* than of an Anonacea. The peculiarity is mainly owing to the presence of three nerves of tertiary order in the interspace between a secondary nerve and its successor. These nerves run more or less parallel with the secondary nerves, and they may anastomose with these or with each other. There are no stomata on the upper surface of the leaf, and the epidermal cells here contain each a single spheraphidal mass. The palisade parenchyme is one cell deep, the layer immediately below it having it cellss somewhat elongated perpendicularly. But few air-spaces occur in the spongy mesophyll, and even these are small. Immersed in the lower part of this tissue are numerous glands of normal appearance. The cells of the lower epiderm usually contain one small mass of spheraphides; rarely two such masses are seen, or a prismatic crystal takes the place of the spheraphides. Stomates are numerous in this layer, each stomate having a couple of subsidiary cells (fig. 6).

The arrangement of the leaf-traces is simple. The three bundles of the petiole unite at the axil into a single strong common bundle which courses down through two internodes, and forks at the second node below that at which it entered the stem. Each of these forks is markedly thinner than the parent bundle, and the shorter of them inserts itself on the neighbouring trace of its own side close to the node, while the longer runs some distance down the third internode to finally unite with the same trace.

By referring to figs. 9–12 of Plate XXXVIII., the reader will at once understand the structure of the anther. As seen in transverse section, the greater part of this organ consists of the relatively large connective, composed mainly of a plexus of delicate cells with brown

walls, in which are immersed numerous sclerenchyme-cells of a yellowish colour; this tissue is traversed by the exceedingly slender vascular bundle. Outside this come two layers of larger cells with light brown walls, and of these the outer abuts on the delicate epiderm. At each end of these two masses of light brown cells is a group of colourless cells with somewhat thickened walls. The exothecium and endothecium are both normal, and, even in the case of anthers from dried flowers, which are all that I have been able to examine, remains of the more or less disorganized tapetum can be made out.

As has already been explained, the anther is multitubular, with loculi arranged one beneath the other in linear series to the number of about fifteen (figs. 8 & 9). Between each pair of loculi is interposed a delicate septum, of which the structure is difficult to make out from dried anthers; each in surface view is seen to be composed of exceedingly thin-walled cells, decreasing in size from periphery to centre. When the development of these anthers comes to be worked out, I suppose it will be found that the archesporial cells, instead of forming a continuous series, are interrupted by thin strips of indifferent tissue. The anther-cells open in the usual way, beginning from above downward, and it would appear that the septa are ruptured during the process; at any rate, in anthers from which the pollen has fallen I could see no trace of septa. With the exception of *Hornschuchia*, I know of no anthers with these serial loculi; they recall to a very slight extent the anthers of the Mimoseæ.

Rollinia incurva (sp. nov.); foliis brevipetiolatis, lanceolatis vel lanceolato-oblongis, obtusis, basi rotundatis, coriaceis, supra nitidis vel nitidulis, glabris, subtus pallidioribus, minute puberulis; costis secundariis utrinque circa 12, angulis latis insertis, sub margine undulatim et fornicatim conjunctis; pedunculis solitariis bigeminisve, petiolos excedentibus, basi bracteatis, et juxta vel supra, nonnunquam vero infra medium bracteolâ parvâ onustis, puberulis; floribus modicis, calyce ferrugineo-pubescente, corollæ arcte ferrugineo-tomentosæ alis spathulato-oblongis ascendenti-incurvis; fructu ignoto.

Hab. Crescit in sylvestribus ad Santa Cruz, ubi mens. Nov. floret. (N. 522.)

Frutex diffusus longiramosus, vix usque trimetralis. Ramuli teretes, purpurascentes vel purpureo-grisei, leviter undulati, creberrime longitrorsum rimati, juveniles puberuli. Foliorum lamina plerumque 10·0–14·0 cm. long., et 3·5–4·5 cm. lat., deorsum parum obliqua; costa media supra impressa, subtus admodum eminens; costæ secundariæ utrinque prominulæ; venulæ arcte reticulatæ, supra maxime aspectabiles; petioli 0·8–1·0 cm. long., supra anguste canaliculati, puberuli. Pedunculi usque 3·0 cm. long., superne ampliati. Bracteæ bracteolæque ovatæ, acutæ, extus ferrugineo-tomentellæ, circa 0·15–0·2 cm. long. Flores lutescenti-virides. Calycis lobi abbreviati, rotundati, carnosuli, concavi, dorso carinati, 0·25 cm. long. Corollæ basi 0·7 cm. diam., alæ usque 1·5 cm. long., superne 0·65 cm. lat. Antheræ 0·1 cm. long. Torus stamineus 0·2 cm. alt., 0·25 cm. diam., pubescens. Carpella albo-sericea, 0·15 cm. long.

Ex affinitate *R. orthopetalæ*, A. DC., arbor cujus folia diversiformia, et petala majora una cum calyce canescenti-tomentosa. [Amazonia, Guiana.]

ANONA CORIACEA, Mart. Fl. Bras. xiii. I. p. 6, ex icon. et descript.

——, var. AMPLEXICAULIS (S. Moore). A typo distat imprimis foliis minoribus insigniter amplexicaulibus. Forsan pro specie propriâ existimanda.

Hab. Floret ad Santa Cruz mens. Nov. *Arrichicúm* incolarum. (N. 517.)

Petala admodum incrassata, intus luteola.

Rhizomatis fimbriæ ad vulnera a morsubus serpentum facta applicantur.

In habit our plant, which is frequent at Santa Cruz, is apparently different from typical *A. coriacea*, which Martius describes as having tortuous branches, inasmuch as it is a lanky erect shrub, 4–6 feet high, and very sparingly branched, if at all.

The popular name "Arrichicúm" is obviously merely a local variation of the Araticú of East Brazil, a term applied to several species of *Anona* there native. [Bras. Or.]

ANONA DIOICA, A. St.-Hil. Fl. Bras. Merid. i. p. 34 (ex descript.).

Hab. Viget in locis apertis arenosis ad Santa Cruz, mens. Nov. florens. (N. 693.)

Eandem plantam legerunt beat. Gardner ad Santa Rosa in provincia Pernambuco (n. 2774 in hbb. Brit. Mus. et Kew) et beat. Burchell (n. 6390 in Hb. Kew). Crescit itaque in Paraguaria, unde misit cl. Balansa (n. 2298). [Bras. Or., Paraguaria.]

ANONA (§ GUANABANI) WALKERI (sp. nov.); caule abunde ramoso, ramulis subteretibus, juvenilibus rufulo-tomentosis, mox glabris, sparsim lenticelliferis; foliis brevipetiolatis, parvis, maxime inæqualibus, ovatis, obtusissimis vel breviter apiculatis, basi paullo rotundatis, interdum leviter coarctatis, supra puberulis, subtus piloso-pubescentibus, membranaceo-coriaceis, obscure pellucide punctatis; pedunculis folia subæquantibus vel quam ea brevioribus, arcte rufo-tomentosis; basin versus minute 1-bracteatis; bracteis subulato-linearibus, rufo-tomentosis; sepalis parvis late triangularibus, longe acuminatis, rufo-tomentosis; petalis exterioribus late ovatis, pet. interioribus quam exteriores paullo brevioribus lineari-oblongis, omnibus acutiusculis, arcte velutinis; gynæcio depresse subgloboso rufo-velutino; fructu ignoto.

Hab. Crescit juxta urb. Cuyabá, ubi flores mens. Aug. præbet. (N. 38.)

Frutex erectus, circa 3 met. alt. Ramuli fusco-cinerei, saltem in sicco crebro et alte rimati. Folia majora cum minoribus mixta, 2·4–5·8 cm. long., medio 2·3–3·6 cm. lat., subtus pallidiora ibidemque eximie nervosa; costæ secundariæ utrinque 6–8, levissime curvatæ, marginem versus dichotomæ indeque arcuatim conjunctæ; venulæ laxe reticulatæ, parum prominulæ; petioli non ultra 0·3 cm. long., canaliculati, basi ampliati, rufo-tomentosi. Pedunculi ad 3·2 cm. long., medio 0·13 cm. crass., erecti, sub flore sensim incrassati, usque ad 0·8 cm. a basi bracteati. Bracteæ circa 0·25 cm. long., pedunculo appressæ. Flores vix 3·0 cm. diam. Sepala viridia, vix 1·0 cm. long., basi 0·5 cm. lat., eorum acumen 0·7 cm. long. Petala exteriora 1·4 cm. long., medio 1·2 cm. lat., pet. interiora 1·2 cm. long., nec ultra 0·7 cm. lat.; pet. omnia carnosa, extus lutea, intus lactea, et secus medium purpurea. Stamina 0·2 cm. long. Gynæcium 0·2 cm. alt., 0·3 cm. diam.

Videtur cum *A. cornifolia*, A. St.-Hil., et *A. spinescenti*, Mart., comparanda, ab illâ abhorrens staturâ altiore, foliis minoribus, pedicellis nec supra medium bracteatis, sepalis

longe acuminatis, ab hac vero ob spinarum absentiam, foliorum indumentum, pedicellos 1-bracteatos dispar, et, alias inter notas, sepalis omnino diversis facile dignoscenda.

The species has been named after Mr. J. C. Walker, a gentleman interested in botany, whose acquaintance I made at Cuyabá, and who very kindly accompanied and helped me while collecting near the city. [Bras. Or.]

ANONA (§ ATTÆ; PILÆFLORÆ) SANCTÆ-CRUCIS (sp. nov.); caule erecto, ramoso, ramulis teretibus, rufo-pubescentibus, dein fere glabris, pallide bruneis, abunde necnon grosse lenticelliferis, in longitudinem crebre rimosis; foliis brevipetiolatis, oblongis vel obovato-oblongis, obtusissimis, basi coarctatis, supra fere glabris, subtus, præsertim in nervo medio, minute rufo-pubescentibus, coriaceo-membranaceis, crebre ac minute punctatis; pedunculis quam petioli longioribus, crassis, juxta basin 1-bracteatis, sericeo-velutinis; bracteis late ovatis, crini brevissimo coronatis; sepalis deltoideo-ovatis, obtusiusculis, arcte velutinis; petalis exterioribus ovato-rotundatis, obtusis, arcte rufulo-velutinis; gynæcio subgloboso, tomentoso; fructu subgloboso, superne paullo coarctato, sparsim ac brevissime tuberculato.

Hab. In nemorosis ad Santa Cruz (Barra dos Bugres), ubi floret mens. Nov. et mens. insequente fructum præbet. Nom. vernac. *Ata.* (N. 585.)

Arbor parva, circa 6 met. alt., erecta, ramos crebros patulos elongatos gerens. Folia ad 15·5 cm. long. (pleraque vero circa 12·0 cm.), medio 4·7–6·5 cm. lat., margine levissime undulata, utrinque pulchre reticulato-nervosa; nervus medius supra impressus, subtus valde eminens; petiolus crassus, puberulus, saltem in sicco arcte transversim rimatus, 0·7 cm. long., 0·2 cm. crass., late canaliculatus. Pedunculus vix 1·5 cm. long. (sub fructu vero 3·5 cm.), medio 0·25 cm. crass. (sub flore ipso vix 0·4 cm., et sub fructu prorsus 0·4 cm.). Bracteæ 0·4 cm. long., 0·3 cm. lat., firmæ, velutinæ, margine ciliolatæ, crebre punctatæ. Flores virides, forsan circa 2·5 cm. diam. Sepala 0·5 cm. long., 0·6 cm. lat., firma, arcte albo-ciliata, punctata. Petala (vix matura) circa 1·5 cm. long., et medio 1·6 cm. lat., carnosa, utrinque velutina; petala interiora nobis non obvia. Gynæcium floris vix maturi circa 1·5 cm. diam. Fructus (edulis et ab incolis magni laudatus) fere maturus magnitudine eam *Citri aurantii* æquans, 6·0 cm. long., medio 6·0 cm. lat. (sub apice modo 3·0 cm.), viridis, tuberculis nec ultra 0·1 cm. e superficie minute scrobiculatâ eminentibus (nonnunquam vero evanidis) sparsim obtectus. Semina 1·3–1·4 cm. long., medio 0·9 cm. lat., ad hilum 0·5 cm. lat.; testa crustacea, lutescenti-brunea, nitens; albumen normale.

Speciebus ab omnibus e subsectione Oblongifloræ distat imprimis petalis ovato-rotundatis. Inter reliquas forte juxta *A. echinatam*, Dun., intercalanda, sed multis de signis ab illa abhorret. [Guiana.]

XYLOPIA GRANDIFLORA, A. St.-Hil. Fl. Bras. Merid. i. p. 40.

Hab. Ad Serra da Chapada mens. Aug. fructificat. (N. 202.) [Bras. Or., Amazonia.]

MENISPERMACEÆ.

CISSAMPELOS PAREIRA, Linn. Sp. Pl. ed. I. p. 1031.
Hab. Ad Santa Cruz floret mens. Oct. (N. 475.) (In tropicis late disseminata.)

CISSAMPELOS TROPÆOLIFOLIA, DC. Syst. i. p. 532.
Hab. Reperi ad Santa Cruz mens. Nov. florentem. (N. 555.) [Peruvia.]

CRUCIFERÆ.

NASTURTIUM PUMILUM, Cambess. in St.-Hil. Fl. Bras. Merid. ii. p. 119.
Hab. Floret et fructificat ad Santa Cruz mens. Nov. (N. 479.) [Bras. Or., Goyaz.]

CAPPARIDEÆ.

CAPPARIS CYNOPHALLOPHORA, Linn. Sp. Pl. ed. II. p. 721, var. MICROPHYLLA.
Hab. Inter Corumbá et Ladario reperi mens. Jan. fructificantem. (N. 1045.) [Amer. Trop. Austr., Ind. Occ.]

CRATÆVA TAPIA, Linn. Sp. Pl. ed. I. p. 444.
Hab. Ad Corumbá floret et fructificat mens. Jan. (N. 949.) [Amer. Trop., Ind. Occ.]

VIOLACEÆ.

CORYNOSTYLIS PUBESCENS (sp. nov.); caule folioso, subtereti, in longitudinem rimoso, crebre lenticellifero, pubescente, demum glabro; foliis sat parvis (maxime inæqualibus), breviter petiolatis, ovato- vel obovato-lanceolatis, obtusis vel obtusissimis vel æqualiter inæqualiterve retusis, margine leviter undulatis seu serrulatis, pag. sup. fere glabris, inf. pubescentibus vel puberulis; pedunculis gracilibus, folia excedentibus vel subæquantibus, pubescentibus; sepalis inæqualibus, oblanceolatis vel oblongo-ovatis, obtusis; petali antici limbo ovato, obtuso, margine undulato; tubo insuper amplo hinc deorsum sensim angustato, apice dilatato; pet. lateralibus late oblongis, margine undulatis, pet. posticis quam lateralia multo brevioribus, obovatis, obtusis; staminibus oblongo-linearibus, quam sepala longioribus, apiculo rotundato-reniformi coronatis; ovario oblongo compresso; stylo stamina subæquante, basi filiformi, superne incrassato; capsulâ non visâ.

Hab. In campis juxta ripas fl. Paraguay ad Carandazinho, inter Corumbá et Dourados, mens. Januar. simul floret et fructificat. (N. 910.)

Suffrutex parvus, crebre ramosus, circa 1 met. alt. Folia 1·8–5·5 cm. long., 1·0–3·0 cm. lat., coriaceo-membranacea, eximie nervoso-reticulata, paginâ superiore nitentia; costæ secundariæ utrinque 5–6, aperte arcuatæ, sub margine tandem conjunctæ; petioli ad 0·5 cm. long., pubescentes. Pedunculi usque ad 5·0 cm. long. Sepala 0·3–0·35 cm. long., 0·1–0·18 cm. lat., uninervia. Flores albi, odorati. Petali antici limbus 0·7 cm. lat., hujus calcar 2·5–2·7 cm. long., sub apice 0·4 cm. lat., parte angustiore 0·2 cm. lat., rectum vel parum curvatum. Petala lateralia 1·0 cm., antica

vix 0·6 cm. long. Staminum loculi fere 0·5 cm., apiculus 0·1 cm. long., hic dimidio superiore aurantiacus.

Corynostylidi hybantho, Mart., arcte affinis, diversa videtur equidem indumento, foliis minoribus aliquanto diversiformibus, corolla tubo infra apicem insigniter angustato, &c. [Amazonia, Guiana, Nov. Granat., Venezuela, Ind. Occ.]

Ionidium lacteum (sp. nov.). Suffrutex? vix spithameus, dense flavescenti-villosus, caule e rhizomate tenui albido obscure annulatim constricto, erecto, leviter angulato, imâ basi cataphyllis parvis flavescenti-bruneis, sursum gradatim in folia transeuntibus instructo; foliis vix sessilibus, oblongo-ovatis, basi parum angustatis, antice dentato-serratis, utrinque flavescenti-villosis; pedunculis quam folia brevioribus, villosis; sepalis semipinnatifido-pectinatis, villosis; petalis dorso villosulis, intus glabris, petali antici, calycem sub 3-plo excedentis, laminâ transversim oblongâ; staminum anticorum filamentis dorso sub anthera incrassatis; glabris, antheris brevissime appendiculatis; ovario villoso.

Hab. In campis ad Serra da Chapada alt. circa 1800 ped. Fl. Aug. (N. 187.)

Folia ad 1·2 cm. long., in sicco subtus pallidiora. Flores lactei. Sepala usque ad 0·7 cm. long., anticum falcato-lanceolatum reliquis paullo majus. Petalum anticum, calycem sub 3-plo excedens, ungue concavo angulato, calyci æquilongo, basi leviter dilatato, laminâ transversim oblongâ, obtusâ, nervosâ, margine crispulâ et dorso villosulâ, vix 1·5 cm. lat.; intermedia duo antico haud multo breviora, lineari-oblonga, dorso villosula; postica duo sepala subæquantia, lineari-oblonga, obtusa, 1-nervia, dorso villosula. Genitalia calyce breviora; antheræ ovatæ, apiculo tenuiter membranaceo spathulato parvo coronatæ, loculis paullo obliquis; filamenta antheris longiora, complanata, glabra. Ovarium ovoideum, dense villosum: stylus sursum dilatatus, glaber; stigma obliquum.

I. Ipecacuanhæ proxima, distat vero ob folia minora, sepala breviora, petalum anticum minus et obtusum (haud aperte emarginatum), petala intermedia lineari-oblonga haud ovate-suborbicularia), antheras apiculo membranaceo loculis multoties breviore coronatas, filamenta staminum anticorum glabra. *I. villosissimum*, A. St.-Hil., ob pedunculum folio suffulciente longiorem, *I. Poayam*, A. St.-Hil., et *I. lanatum*, A. St.-Hil., ob sepala integerrima faciliter nostrâ a stirpe dignoscere potes. [Amer. Trop.]

Ionidium commune, A. St.-Hil. Pl. Rem. p. 295.

Hab. Crescit juxta Corumbá, mens. Jan. florens. (No. 1048.) [Bras. Or.]

Ionidium oppositifolium, Roem. & Schult. Syst. Veg. v. p. 395.

Hab. Crescit juxta fl. Paraguay inter Santa Cruz et Villa Maria, itaque inter Villa Maria et Corumbá. (Nn. 822, 1023.) [Amer. Trop. Austr.]

Alsodeia, sp. nov.? aff. A. ovalifoliæ, Britton in Bull. Torr. Bot. Club, xvi. p. 18.

Hab. Viget in ripâ fl. Paraguay inter Santa Cruz et Tres Barras, ubi fructificat mens. Oct. (N. 502.)

This has almost exactly the leaves of *Alsodeia antifolia*, except for the absence of soft pubescence on the back and on the petiole. The capsule is longer and nearly glabrous, and, if the only capsule on the type-specimen at Kew be mature, firmer in consistence, besides having narrower, more sharply acuminated and prominently reticulated valves. I have not seen flowers. [Bolivia.]

SAUVAGESIA ERECTA, Linn. Sp. Pl. ed. II. p. 203.

Hab. Ad Santa Cruz floret mens. Sept. (N. 754.) [Amer. Trop., Afr. Trop., Ind. Arch.]

BIXINEÆ.

COCHLOSPERMUM INSIGNE, A. St.-Hil. Pl. Us. sub tab. 57, var. ? An sp. diversa ?

Hab. Florebat et fructificabat, foliis orbum, juxta Cuyabá mens. Aug. (N. 29.)

Dr. Warburg, who saw my specimens, considered it unsafe, in the absence of leaves, to absolutely identify them. [Amer. Trop.]

POLYGALACEÆ.

POLYGALA RHODOPTERA, Mart. ex A. W. Benn. in Mart. Fl. Bras. xiii. pars iii. p. 11.

Hab. Ad Santa Cruz flores dilute viridi-purpurascentes præbet mens. Nov. (N. 669.) [Bras. Or., Goyaz, Amer. Centr.]

POLYGALA HIRSUTA, A. St.-Hil. Fl. Bras. Merid. ii. p. 45.

Hab. Crescit ad Serra da Chapada. (No. 193.) [Bras. Or.]

POLYGALA HYGROPHILOIDES, (sp. nov.) ; caule quadrangulari, sursum sparse ramoso ; foliis brevissime petiolatis, infimis verticillatis, reliquis approximatis vel subdistantibus, lanceolatis, apice acute mucronatis; racemis terminalibus, elongatis, pedunculatis, cylindricis, densifloris; sepalis exterioribus oblongo-ovatis, apiculatis; alis corollâ multo longioribus, late obovatis, obtusissimis; carina cristâ bipartitâ, segmentis iterum bifidis superne dorso instructâ ; seminibus subcylindricis, horum carunculâ breviter biappendiculatâ.

Hab. Matto Grosso (*Leeson*, in Herb. Brit. Mus.).

Planta spithamea, radice brevi sparsim ramoso instructa. Caulis in longitudinem striatus, obscure 4-alatus, superne puberulus. Folia ±2·0 cm. long., 0·4–0·7 cm. lat., glanduloso-punctata. Racemi pedunculis 2·0 cm. long. attingentibus insidentes, usque ad 6·0 cm. long., vix 1·0 cm. diam., sursum angustati, apice inconspicue comosi, deorsum cicatriculis florum dilapsorum muniti. Bracteæ lineari-lanceolatæ, longe acuminatæ, dorso obtuse carinatæ ibidemque nigro-glandulosæ. Sepala exteriora inæqualia, carinata, sep. maximum 0·2 cm. long. ; alæ 0·33 cm. long., 0·27 cm. lat., dorso carinulatæ et nigro-glandulosæ. Petala oblongo-ovata, obtusa, vix usque ad medium tubo staminali adnata, carinam galeatam in fructu persistentem superantia. Antheræ filamenta libera subæquantes. Stylus brevis, crassiusculus, ovario æquilongus. Stigma cucullatum et cristâ elongatâ

superne præditum. Capsula cordato-suborbicularis, membranacea, 0·2 cm. long. Semina fusco-brunea, hispidula, 0·15 cm. long., 0·08 cm. lat.; carunculæ appendices late oblongæ, quam semen saltem triplo breviores.

Polygala Timoutou, Aubl., *P. timoutoidi*, Chodat, et *P. hygrophilæ*, H. B. K., affinis, ab illis vero primo obtutu secernenda ob habitum ramosum et racemos elongatos pedunculatos. Ceterum *P. timoutoides* sepala exteriora calva, carinæ cristam parvam, necnon seminum minorum carunculam longe appendiculatam ostendit, et *P. Timoutou* racemos conspicue comosos, alas acutas, et semina appendicibus seipsam saltem semiæquantibus instructa. *P. hygrophila*, planta elatior, foliis angustis, racemis et floribus minoribus, carinæ cristâ dentatâ, seminum carunculâ longius appendiculatâ gaudet. [Amer. Trop.]

Polygala angulata, DC. Prod. i. p. 328.
Hab. Reperi ad Serra da Chapada. (N. 188.) [Amer. Trop.]

VOCHYSIACEÆ.

Callisthene fasciculata, Mart. Nov. Gen. et Sp. i. p. 126.
Hab. Ad Jangada flores suaveolentes præbet mens. Sept.; mens. seq. floret ad Santa Cruz. (Nn. 260, 539.) [Bras. Or., Goyaz, Bolivia.]

Callisthene, sp. nov., ex affinitate præcedentis, abs qua diversa videtur ob folia majora (usque ad 16·0 cm. long. et 7·0 cm. lat. interdum attingentes) per paria plerumque 4–8 ramulis florentibus insidentia. Flores non suppetebant. Fructus admodum minutissimi solummodo obvii, cylindrici, glabri, rugati, 0·5 cm. long., pedunculis crassiusculis pubescentibus usque 1·0 cm. long. fulti, et stylo paulisper persistente sæpe incurvo iis ipsis æquilongo coronati.
Hab. Frutex altus, vel potius arbuscula; crescit ad Santa Cruz. (N. 731.) [Bras. Or., Goyaz, Bolivia.]

Qualea grandiflora, Mart. Nov. Gen. et Sp. i. p. 133.
Hab. Crescit juxta Santa Cruz, mens. Nov. florens. *Pautéra* incolarum. (N. 740.)
The popular name, spelt as above, was given me by an intelligent inhabitant of Santa Cruz. Martius spells it *Pão terra*, and this I suspect to be the correct rendering. The fruit is mashed up and applied to sores at Santa Cruz. [Bras. Or., Goyaz, Amazonia.]

Qualea parviflora, Mart. Nov. Gen. et Sp. i. p. 135.
Hab. Ad Santa Cruz mens. Oct. florescit. (N. 486.)
Mine is the "forma glaberrima"—very different in its leaves from typical *Q. parviflora*, but apparently identical in its flowers. [Bras. Or.]

Qualea pilosa, Warm. in Mart. Fl. Bras. xiii. pars ii. p. 45.
Hab. Crescit ad Santa Cruz, Dec. florens. (N. 751.)

Vochysia divergens, Pohl, Pl. Bras. Ic. ii. p. 19 (ex icon. et descript.).
Hab. Matto Grosso (*Leeson*, in Herb. Mus. Brit.). [Bras. Or., Goyaz.].

SALVERTIA CONVALLARIODORA, A. St.-Hil. in Ann. Mus. Paris, vi. (1820) p. 266.

Hab. Viget passim prope Cuyabá, fructus gerens mens. Aug. (N. 28.) [Bras. Or., Goyaz, Amazonia.]

CARYOPHYLLEÆ.

POLYCARPON APURENSE, H. B. K. Nov. Gen. et. Sp. vi. p. 33 (*Pharnaceum depressum*, Linn.).

Hab. Crescit ad Santa Cruz, ubi floret mens. Nov. (N. 601.) [In tropicis utriusque orbis late dispersa.]

PORTULACACEÆ.

PORTULACA OLERACEA, Linn. Sp. Pl. ed. I. p. 445.

Hab. Reperi ad Santa Cruz. (N. 664.) [Latissime disseminata.]

PORTULACA PILOSA, Linn. Sp. Pl. ed. I. p. 445.

Hab. Viget ad Puerto Pacheco. (N. 1052.)

I refer my specimen to Rohrbach's Lusus I., forma *a*. [Amer. Trop. et Subtrop.]

TALINUM CRASSIFOLIUM, Willd. Sp. Pl. ii. p. 864.

Hab. Floret ad Corumbá mens. Jan. (N. 1030.) [Amer. Trop. Austr., Ind. Occ.]

HYPERICACEÆ.

VISMIA DECIPIENS, Cham. et Schlecht. in Linnæa, iii. p. 116.

Hab. Reperi in cacumine montium Serra da Chapada. (N. 137.) [Bras. Or.]

VISMIA JAPURENSIS, Reichardt in Mart. Fl. Bras. xii. pars i. p. 209, ex icon. et descript.

Hab. Ad Santa Cruz floret mens. Nov. (N. 609.) [Amazonia.]

GUTTIFERÆ.

RHEEDIA GUACOPARÝ (sp. nov.). Glaber, caule erecto, ramoso, plus minus quadrangulari, in sicco manifeste canaliculato; foliis petiolatis, oblongo-ovatis, acutis, basi rotundatis vel paullo coarctatis, margine undulatis vel undulato-repandis, coriaceis; pedunculis quam petioli brevioribus, plerumque solitariis; petalis ovatis, obtusis, reflexis; toro stamineo inferne lato, nequaquam acuto; staminibus circa 19, quam petala brevioribus; ovario depresse ovoideo, staminibus plerisque longiore, 1–2-loculari; fructu globoso 1-spermo.

Hab. Frequens ad Santa Cruz et juxta ripas vicinas fl. Paraguay, ubi menss. Sept.–Nov. flores et fructus simul gerit. *Guacoparý* incolarum. (Nn. 332, 365, 467.)

Frutex altus vel arbor parva, ad 9 met. alt. Rami crassi, nonnunquam fere teretes, cinerei; ramuli sæpe per paria supra axillares orti. Folia maxime inæqualia, 3·0–15·0 cm. long., medio 1·5–7·5 cm. lat., obscure inæquilateralia, haud in sicco nitentia, nec subtus decoloria, nervi omnes utrinque eminentes; petioli 0·7–vix 2·0 cm. long., pingues, basi ampliati, canaliculati, in sicco transversim corrugati.

Pedunculi e nodis plus minus tumidis provenientes, circa 1·0 cm. long. et 0·05 cm. crass., in longitudinem striati. Flores 0·7 cm. diam., albi, inodorati. Petala 0·5 cm. long., 0·3 cm. lat., minutissime pellucido-punctata. Filamenta diversæ longitudinis, longiora 0·25 cm., breviora nec ultra 0·15 cm. long., inferne parum ampliata; antheræ didymæ, minutæ; torus stamineus circa 0·075 cm. alt. Ovarium 0·2 cm. long., sub stigmate eminente parum coarctatum. Fructus magnitudine nunc baccam *Ribis Grossulariæ*, nunc drupam parvam *Pruni domesticæ* æquans, luteus, exocarpio tenui coriaceo nitido obtectus; semen 1·5 cm. long., 0·7 cm. lat., compressum, succo subacido grato circumfusum et endocarpio membranaceo-carnoso albo inclusum.

Videtur ad *R. Gardnerianam*, Planch. & Triana, et *R. Spruceanam*, Engl., proxime accedere, abs quâ, notas inter alias, foliis diversiformibus necnon floribus majoribus stirpem nostram facile dignoscere potes.

Of this plant, which appears in two forms, one with smaller leaves narrowed below, the other having larger leaves rounded at the base, the fruit is highly esteemed at Santa Cruz, and its juice is frequently employed in place of vinegar; the berries also are said to be a good bait for certain of the Paraguay fish. [Bras. Or., Amazonia, Peruvia.]

Platunia ?, sp. nov. Arbor elata, glaberrima, ramulis subteretibus, inter se 4·0–7·0 cm. distantibus, foliigeris; foliis oblongis vel obovato-oblongis, obtusis vel retusis, basi obtusis, 15·0–18·0 cm. long., 5·0–7·0 cm. lat., vivis saturate viridibus, in sicco pallidis; costis secondariis distantibus circa 8, angulis latis insertis, fere rectis, demum subito undulato-arcuatis, supra impressis, subtus parum eminentibus; petiolis vix usque ad 1·0 cm. long. crassiusculis, longitrorsum rugatis, superne anguste canaliculatis; floribus ignotis; baccis indehiscentibus, pyriformibus, magnitudine *Fici*, aurantiacis, coriaceis, intus carnosis, 2–4-locularibus, usque ad 5·0 cm. long., 4·0 cm. diam.; seminibus 2–4 in pulpo sapido jacentibus, oblongis, usque ad 2·0 cm. long., 1·0 cm. diam.

Hab. Crescit in ripa fl. Paraguay ad Santa Cruz et alibi in vicinia, ubi mens. Nov. fructificat. *Bacurý* incolarum. (N. 462.)

According to authors, *Bacurý* is the name given to the fruit of *Platonia insignis*, Mart., and of *Rheedia macrophylla*, Planch. & Triana. The present plant is, however, quite different from either of these, the venation of its leaves being more like what we find in the genus *Tovomita*, although, from the nature of the seed, I conclude that it cannot be placed in the latter genus. From the fact of our Paraguayan peons knowing this fruit well, it is to be presumed that the tree has a considerable range to the southward.

TERNSTRŒMIACEÆ.

Kielmeyera (§ Corymbosæ) amplexicaulis (sp. nov.). Suffrutex, caule erecto, crassiusculo, tereti, glabro; foliis vix omnino sessilibus, oblongis vel oblanceolato-oblongis, obtusis vel obtusissimis, leviter amplexicaulibus, coriaceis, glabris; paniculis corymbiformibus, folia haud excedentibus, foliis hebetatis interjectis; sepalis subæqualibus, ovato-lanceolatis, acutiusculis, dorso carinatis: petalis ovatis vel ovato-oblongis, obtusis,

vel obscure retusis, breviter lateque unguiculatis, planis vel carinatis; staminibus quam petala duplo brevioribus; antheris linearibus, obtusis, apice glandulâ minutâ instructis; connectivo latiusculo; ovario ovoideo trigono, in stylum crassum staminibus subæquilongum subito desinente; stigmate depresse pyramidali; fructu . . . . .

Hab. Viget in campis ad Serra da Chapada, alt. circa 1800 ped. supra mare. Fl. Aug. (N. 183.)

Crescit circa ad ⅔ met. alt. Caulis simplex, basi incrassatus, e rhizomate lignoso cortice squamoso obtecto, plenitudine pennam anserinam duplo excedente. Folia plerumque 10·0–12·0 cm. long., 3·5–4·5 cm. lat., nervo medio subtus eminente, nervis lateralibus impressis, copiose glandulosa; folia hebetata reliquis subconformia, 0·6–1·7 cm. long. Paniculæ ad 10·0 cm. long., circa 5·0 cm. diam. Flores albi, odorati. Sepala 0·8 cm. long., 3·0–4·5 cm. lat., glabra vel medio dorso leviter rufo-puberula. Petala fere omnino glabra, margine undulata, 1·7 cm. long. Ovarium 0·4 cm. long.; stylus ovario subæquilongus.

A *Kielmeyerâ corymbosâ*, Mart., cujus vix est varietas, differt præsertim foliis amplexicaulibus et petalis majoribus glabris. [Bras. Or., Goyaz.]

MALVACEÆ.

Sida cordifolia ?, Linn. Sp. Pl. ed. I. p. 684.

Hab. Crescit ad Santa Cruz, ubi *Tamarindo do Campo* nuncupatur.

The leaves of this plant, boiled, are used as an emollient. [In regionibus tropicis et subtropicis vulgatissima.]

Wissadula decora (sp. nov.). Tenuiter lanato-tomentosa, caule copiose ramoso, subtereti; foliis petiolatis ovatis, nonnunquam vero ovato-lanceolatis, obtusis, basi alte cordatis, inæqualiter vel subæqualiter crenato-dentatis, 6–7-nerviis, stipulis setaceis petiolo multo brevioribus; floribus in paniculas subbreves digestis; pedicellis pro genere brevibus, calycis tomentosi lobis deltoideis, acutatis, subæqualibus; petalis calycem 3-plo excedentibus; andrœcio quam calyx longiore; ovario 3-mero, 3-loculari, glabro; stylis 3 basi ipsâ connatis; ovulis 2 vel 3 pendulis: si 2, ambobus juxta apicem loculi affixis; si 3, duobus apicalibus, tertio in medio loculo posito.

Hab. Abundat in campis juxta fl. Paraguay ad Puerto Pacheco. Fl. Feb. (N. 1061.)

Suffrutex ? parvus, erectus, decorus. Ramuli tenues, vix 0·2 cm. crass. Foliorum lamina 1·5–3·5 cm. long., 1·0–2·0 cm. lat., subtus pallida; petioli filiformes, 1·0–ultra 2·5 cm. long., patuli; stipulæ 0·2 cm. long., deciduæ. Paniculæ circa 10·0 cm. long., subpyramidales, multifloræ, graciles; pedicelli ad 2·0 cm. (plerumque vero circa 0·5–1·0 cm.) long., filiformes, tomentosi; bracteæ stipulis subsimiles, deciduæ. Flores lutei, 1·5 cm. diam. Calycis tubus 0·3 cm. long.; lobi 0·14–0·2 cm. lat., vix 0·2 cm. long. Petala obovata, obtusissima, delicatula, basi leviter pilosa, 0·8 cm. long. Andrœcium 0·4 cm., tubo circa 0·15 cm. long. Ovarium 0·1 cm. long., puberulum; styli filiformes, andrœcio longiores, stigmatibus capitatis, circa 0·025 cm. diam. Capsula deest.

Planta cum *Wissadulâ gymnanthemâ*, K. Schum., comparanda, specie quæ ovario trimero sæpe gaudet, ab illâ vero optime abhorret habitu et foliis omnino disparibus, calyce minore, ovario nunquam tetramero, etc.

This is a very elegant little plant, which, in the absence of capsules, I regret my inability to assist in introducing into cultivation.

Schumann (Mart. Fl. Bras. xii. pars iii. p. 438) correctly states that the ovules of this genus are all pendulous, and not, as say the authors of the 'Genera Plantarum,' some pendulous and some ascending. With respect to the constant trimerous symmetry of the carpel, which is abnormal for the genus, I may here add that the carpellary symmetry of *W. periplocifolia*, Presl, said by Schumann to be pentamerous, is by no means so always, as on several occasions I have had before me 3- and 4-lobed carpels respectively with three or four styles. [Argentina.]

Abutilon crispum, Sweet, Hort. Brit. ed. I. p. 53.

Hab. Crescit ad Santa Cruz, mens. Sept. florens. (N. 296.)

Mine is a monospermous form, the ovules being always solitary in the cells, and the seeds of course solitary. Moreover, the stems, petioles, and fruits are pubescent merely, never hirsute, as is almost always the case with *A. crispum*. The plant is certainly not a good *Abutilon*, and perhaps it would be better to keep up the genus *Belœre*, Shuttlew., for the reception of monospermous Malvaceæ with *Abutilon*-like unappendaged seeds. That genus would then comprise, besides the present plant, one from Brazil recently described by Schumann under the name of *A. monospermum*, and several others with carpels constantly 1-seeded. The attachment of the ovule, too, to the septum, instead of to the bottom or top of the cell, is a fact full of suggestion. This is a question, however, on which I am not disposed to give a definite opinion. [Amer. Trop. et Subtrop., Ind. Or.]

Sphæralcea miniata, Spach, Hist. Nat. Vég. iii. p. 352.

——, var. leiocarpa, S. Moore; foliis ovato-oblongis, crenatis vel breviter lobulatis, supra minute pubescentibus, subtus molliter tomentosis; inflorescentiis sessilibus vel breviter pedunculatis, floribus aggregatis; carpidiis intus basi levibus vel apice obscure reticulatis, sæpe 3-spermis.

Hab. Matto Grosso (*Leeson*, in Herb. Mus. Brit.). [Argentina.]

Pavonia speciosa, H. B. K. Nov. Gen. et Sp. v. p. 231.

——, var. polymorpha, Garcke.

Hab. Reperi ad Jangada, mens. Sept. florentem. (N. 281.) [Amer. Trop., Ind. Occ.]

Pavonia Morongii, S. Moore ex Morong & Britton in Ann. N. York Acad. Nat. Sc. vii. p. 58; caule erecto, ramulis subpatulis, ramoso, piloso-tomentoso; foliis parvis, petiolatis, ovatis, obtusis, basi rotundatis necnon aliquanto cordatis, margine impariter grosse crenato-serratis, 7-nerviis, tenuiter tomentosis, subtus albidis; stipulis fugaceis, subulato-setaceis, petiolo brevioribus; floribus in axillis fol. superiorum vel ad apicem ramulorum solitariis, longius pedunculatis; involucri phyllis 6–9, tomentosi-pilosis,

calyce circa duplo longioribus; calycis tubo ampliato, basi 10 superne 15-nervato, lobis ovato-lanceolatis tubo subæquilongis; floribus circa 1·2 cm. diam.; carpidiis calvis, maxime depressis, ecarinatis, facile in valvulas duas dehiscentibus.

Hab. Crescit prope Corumbá sine numero; fl. Jan.

Suffrutex parvus, vix ½ met. alt. Radices albi, sparsim fibrosi. Caulis demum fere omnino glaber; pallide bruneus, juxta basin crebre longitudinaliter rimosus; ramuli graciles, teretes. Folia 1·2–2·0 cm. long., medio 1·0–2·0 cm. lat.; stipulæ puberulæ 0·35 cm. long; petioli ad 2·2 cm. long. (plerique vero breviores), graciles, pilosi-tomentosi. Pedunculi ad 3·5 cm. long. (plerumque circa 3·0 cm.), graciles, supra medium articulati, pilosi-tomentosi. Involucri phylla circa 1·0 cm. long., filiformia. Calycis piloso-tomentosi tubus 0·3 cm. long.; lobi 0·4 cm. long., 3-nervati. Flores lutei. Carpidia 0·4 cm. long. et 0·4 cm. lat., venosa (nervo medio parum eminente), in sicco virentia. Semina obconica, vix 0·3 cm. diam., glabra.

Affinis *Pavoniæ Balansæ*, Guerke, et *P. Hieronymi*, Guerke, sed multis notis ab ambabus dispar.

The easy splitting of the carpidia, seen also in the case of *P. Balansæ*, is curious, and might perhaps justify the creation of a new genus. The greatly depressed form of the same organs is also unlike what we usually find among the Pavonias. [Paraguaria.]

PAVONIA MUTISII, H. B. K. Nov. Gen. et Sp. v. p. 283.

——, var. HEXAPHYLLA, S. Moore. A typo discrepans vestitu pilorum patentium, habitu gracili, pedunculis tenuibus, involucri phyllis plerumque 6, raro 7, angustis (0·05 cm. lat.), sed vix, me judice, species propria.

Hab. Crescit ad ripam fl. Paraguay, prope Barra do São Lorenzo. (N. 10.)

Hujus varietatis exstant formæ duæ, foliis alterius subtus canescenti-tomentosis, alterius canescenti-pubescentibus, dein pubescentibus. Hæc involucri phyllis brevibus calycem vix excedentibus gaudet, illius involucri phylla contra calyce duplo longiora. [Bras. Or., Colombia.]

PAVONIA ROSA-CAMPESTRIS, A. Juss. in A. St.-Hil. Flor. Bras. Merid. i. p. 236.

Hab. Crescit in cacumine montium Serra da Chapada, mens. Aug. florens. (N. 181.) [Bras. Or.]

PAVONIA OPULIFOLIA (sp. nov.); caule erecto, subtereti, stellatim tomentoso, mox appresse pubescente; foliis petiolatis, late cordatis, 3–5-lobatis (plerumque 3-lobatis), impariter grosse crenato-serratis, 7–9-nerviis, sparsim stellatim pubescentibus et ad nervos tomentosis; stipulis lanceolatis ovato-lanceolatisve, quam petioli brevioribus; floribus in axillis fol. superiorum solitariis; pedunculis quam petioli longioribus; involucri phyllis 13–14, calyci subæquilongis; calycis lobis lanceolatis, tubo longioribus; corollâ vix 2·0 cm. diam.; tubo stamineo 0·6 cm. long.; stylis obscure puberulis; carpidiis calvis, medio dorso leviter carinatis.

Hab. Inveni mens. Aug. ad ripas fl. Cuyabá vigentem, loco longinquo ab urbe Cuyabá iter duorum dierum. (N. 3.)

Suffrutex incertæ altitudinis, erectus. Internodia 1·0–2·7 cm. long. Folia 2·0–5·0 cm. long., medio 2·0–4·5 cm. lat., subtus decoloria; petioli 1·2–2·0 cm. long., patuli, tomentosi; stipulæ 0·4 cm. long., scariosæ, pubescentes. Pedunculi 1·5–2·5 cm. long., tomentosi. Involucri phylla anguste linearia, tomentosa, usque ad 1·1 cm. long. Calycis tomentosi tubus amplus, 10-nervosus, 0·3 cm. alt.; lobi vix 0·8 cm. long., 3-nervosi, recte vel oblique acuti. Petala lutea, parum obliqua, obovata, obtusissima, breviter lateque unguiculata, circa 2·0 cm. long., medio 1·0 cm. lat. Andrœcium circa 1·5 cm. long. Styli andrœcium paullo excedentes. Carpidia 0·5–0·6 cm. long., medio dorso 0·35 cm. lat., lateribus eximie venosis fere cristatis, apice obtusa.

Affinitatem præbet cum *Pavoniâ humifusâ*, A. Juss., quæ habitu dispari, foliis majoribus longius petiolatis haud impariter crenato-serratis, internodiis longioribus, stipulis subulato-filiformibus, involucri phyllis 14–18 inter alia propria gaudet.

Pavonia opulifolia, var. major, S. Moore. A typo divergens habitu robustiore, staturâ altiore ? (ultrametrali), floribus majoribus, involucri phyllis calyce fere duplo longioribus (vix ad 2·0 cm. long.) hirsutis, necnon carpidiis paullo majoribus (0·6–0·7 cm. long.) apice acutis, in sicco fuscioribus.

Hab. Crescit in campis ad ripas fl. Paraguay juxta Corumbá, ubi mens. Jan. flores et fructus præbet. (N. 913.)

At first sight this plant and the type seem very unlike, but close examination reveals so many points of agreement that I refrain from making two species of them. The specimens which have served for the description of the type are small pieces hastily gathered, on our way up to Cuyabá, at one of the log-cutting settlements; hence they probably do not do full justice to the species—an additional reason, this, for the course here taken. The difference in time of flowering of type and variety is noteworthy.

In the description of the length of the staminal tube (in species of *Pavonia*) I have measured only the distance between its bottom and the point whence the first batch of stamens is given off. [Bras. Or.]

Pavonia velutina, A. Juss. in A. St.-Hil. Fl. Bras. Merid. i. p. 233.

Hab. Fructificat ad Serra da Chapada mens. Aug. (N. 140.) [Amer. Austr. Trop.]

Cienfuegosia phlomidifolia, Garcke, in Bonplandia, viii. p. 148.

Hab. Floret ad Jangada mens. Sept., itaque ad Santa Cruz mens. seq. (Nn. 270, 452.) [Amer. Austr. Trop.]

Cienfuegosia sulphurea, Garcke, in Bonplandia, viii. p. 148.

Hab. Reperi ad Puerto Pacheco mens. Feb. florentem. (N. 1056.)

The first recorded tropical habitat for this plant. [Uruguaria, Argentina, Paraguaria.]

Bombax ?, sp., forsan ex affinitate *B. parvifloræ*, Mart. et Zucc. Arbor 6-metralis, capsulis oblongis lanâ fulvescenti repletis, valvis 8·0 cm. long., 1·5–2·0 cm. lat., nitidulis, extus

ochraceo-bruneis, intus cinereis; seminibus, magnitudine pisi, testâ bruneâ obtectis. Nec flores nec folia suppetebant.

Hab. Ad Cuyabá mens. Aug. fructificat. (N. 41.)

The wool is used for stuffing purposes at Cuyabá.

STERCULIACEÆ.

HELICTERES GUAZUMÆFOLIA, H. B. K. Nov. Gen. et Sp. v. p. 304.

Hab. Crescit ad Santa Cruz, necnon juxta Corumbá. (Nn. 383*, 904, 1002.) [Amer. Trop.]

HELICTERES CORYLIFOLIA, Nees & Mart. in Nov. Act. Acad. Nat. Cur. xii. p. 44.

Hab. Ad Santa Cruz flores præbet menss. Sept.–Nov. (N. 294.) [Bras. Or.]

HELICTERES CHAPADENSIS (sp. nov.); caule erecto, tereti, sparsim foliato, molliter lanato-tomentoso, demum fere glabro; foliis parvis, petiolatis, ovatis, obtusis vel obtusissimis, margine impariter serratis, molliter ac tenuiter lanato-tomentosis; stipulis subulato-filiformibus, petiolo fol. evolutorum brevioribus, firmis, tomentosis, deciduis; dichasiis 2–3-floris ad apicem ramulorum brevium digestis; prophyllis filiformibus, tomentosis, caducis; floribus horizontalibus; calycis elongati, anguste tubulosi, basi sensim coarctati, lanato-tomentosi lobis inæqualibus lanceolatis vel ovato-lanceolatis, acuminatis, tubo 3-plo brevioribus; petalis calycem circa $\frac{1}{4}$ excedentibus, anguste spathulatis, obtusis, longius unguiculatis, supra unguem dentibus 2 paullo curvatis auctis vel omnino calvis; gynophoro calycem ultra 3-plo excedente, curvato, filiformi, glabro; tubo stamineo vix evoluto; staminodiis spathulatis, acutis; ovario quam calyx multo breviore, oblongo, leviter contorto; stylis connatis, tortis; fructu ignoto.

Hab. In convalle ad Serra da Chapada reperi mens. Aug. (N. 76.)

Suffrutex erectus, 1 met. alt., inferne aphyllus, sparsim ramosus. Ramuli breves (nec ultra 1·0 cm. long.), ex axillis fol. dilapsorum soli floriferi. Foliorum lamina ad 3·0 cm. long., medio ad 3·2 cm. lat., subtus eximie reticulato-venosa et 5-nervia; petiolus ad 1·3 cm. long., pinguis, lamina sub ipsa incrassatus, lanato-tomentosus; stipulæ circa 0·5 cm. long. Pedicelli 0·5–0·7 cm. long., 0·075–0·1 cm. crass., tomentosi. Prophylla ad 0·8 cm. long., plerumque incurva. Calycis tubus 1·3–1·6 cm. long., imâ basi tantummodo 0·2 cm. lat., superne usque 0·4 cm. amplificatus, haud nervosus; lobi circa 0·5 cm. long. Petala 2·2–2·4 cm. long., coccinea, eorum unguis 0·7 cm. long. Gynophorum 6·5–7·0 cm. long., superne attenuatum. Stamina 10; antheræ 0·13 cm. long.; staminodia antheris subæquilonga. Ovarium vix 0·2 cm. long.

Cum *H. molli*, K. Schum., comparanda, abs quâ nullo negotio dignoscenda, imprimis foliis minoribus, subtus eminenter nervosis, haud argute serratis, calycis tubo coarctato, etc. [Bras. Or., Goyaz.]

HELICTERES BREVISPIRA, A. St.-Hil. Fl. Bras. Merid. i. p. 274.

Hab. Floret ad Santa Cruz mens. Oct. (N. 650.) [Bras. Or., Nov. Granat.]

Helicteres orthotheca (sp. nov.); caule erecto, tereti, tomentoso, demum fere glabro, cortice subcinereo, crebro lenticellifero, anguste elliptice rimoso obtecto; ramulis tomentosis, copiose foliatis; foliis petiolatis, ovatis, acutis vel obtusis, impariter crenato-serratis, supra stellatim pubescentibus, subtus albide tomentosis; stipulis subulato-filiformibus, quam petioli brevioribus, concinnis, pedunculatis, 4–7-floris, nonnunquam apicem versus ramulorum subcongestis; prophyllis caducissimis; floribus horizontalibus, calyce amplo tubuloso inæqualiter 5- (an semper ?) lobo tomentoso, lobis tubo 3-plo brevioribus; petalis calycem circa $\frac{1}{4}$ excedentibus, spathulato-panduriformibus, apice bilobis, ungue quam lamina duplo breviore; gynophoro calycem 4-plo excedente, curvato, in sicco plerumque subligulato, glabro; tubo stamineo evoluto; staminodiis lineari-spathulatis; ovario quam calyx multoties breviore, oblongo, recto; stylis rectis; fructu elongato, recto, 5·3 cm. long.

Hab. Frequens in fruticetis ad Santa Cruz, ubi fl. et fruct. gerit menss. Nov. et Dec. (N. 556.)

Frutex circa ad 3 met. alt. Caulis circa 0·6 cm. diam. Foliorum lamina 3·0–8·0 cm. long., 2·0–7·5 cm. lat., 7–8-nervia, chartacea; petioli 1·0–1·5 cm. long., tomentosi. Stipulæ circa 0·8 cm. long., tomentosæ. Pedicelli 0·2–0·7 cm. long., tomentosi. Calycis utrinque tomentosi tubus vix 1·5 cm. long., medio 0·8 cm. lat., eminenter 10-nervatus; lobi 0·5 cm. long., late ovati, obtusi vel obtusiusculi, 0·4–0·6 cm. long. Petala 2·5 cm. long., juxta apicem 0·7 cm. lat., rubra. Gynophorum vix 8·0 cm. long., vix 0·1 cm. lat., sub fructu 0·35 cm. lat. Tubus stamineus 0·3 cm. lat., et circa 0·3 cm. long., late cyathiformis, glaber, eminenter nervosus. Stamina 10. Staminodia 0·4 cm. long., 1-nervosa. Ovarium vix 0·3 cm. long., tenuiter tomentosum. Fructus oblongi; valvulæ apice sat subito coarctatæ, dorso tomento tenui gaudentes, eminenter nervosæ, leviter carinatæ.

Species ob fructum magnum, elongatum, rectum nulli nisi *H. Rusbyi*, Britton (*Balansa*, n. 1602), affinis, cujus folia attamen disparia longius petiolata utrinque tomentosa, gynophorum longius, fructus brevior (4·5–5 cm. long.), etc. [Bolivia, Paraguaria.]

Melochia graminifolia, A. St.-Hil. Flor. Bras. Merid. i. p. 160.

Hab. Crescit ad Jangada, itaque ad Santa Cruz. (Nn. 258, 311.) [Bras. Or., Goyaz, Nov. Granat., Guiana.]

Melochia (§ Riedlea) corumbensis (sp. nov.). Suffruticosa, molliter pubescenti-tomentosa, caule stricto subtereti; foliis petiolatis, oblongo-ovatis, obtusis, basi rotundatis vel obtusis; irregulariter dentatis vel dentato-crenatis; inflorescentia petiolo breviore (nonnunquam vero subæquali vel longiore), cymosa, pluriflora; prophyllis linearibus, acutis; calycis cupuliformis lobis subdistantibus, deltoideo-acuminatis; petalis obovato-oblongis, obtusis, basi breviter unguiculatis, glabris; tubo stamineo puberulo (floris brevistyli petalis breviore); ovario sessili.

Hab. Viget in locis planis juxta Corumbá, mens. Jan. fl. (N. 905.) Eandem plantam in Matto Grosso legit Leeson, in speciminibus in Herb. Brit. Mus. servatis.

Caulis 3·0–4·5 cm. crass., arcte in longitudinem sulcatulus. Stipulæ deciduæ, lineari-

subulatæ, acuminatæ, pilosi-tomentosæ, circa 0·4 cm. long. Petioli 1·2–3·2 cm. long., sub laminâ paullo ampliati ibidemque nonnunquam arctissime bialati, piloso tomentosi; lamina 4·0–7·0 cm. long., basi 5–8-nervis. Prophylla piloso-tomentosa, 0·2 cm. long. Cymæ ad 2·0 cm. diam. Calycis lobi 0·2 cm., tubus vix 0·3 cm. long. Petala 0·7 cm. long., purpurea. Filamenta fl. brevistylium gynæcio duplo longiora. Capsula hirsuto-tomentosa, oblate sphæroidea, pentagona, vix 0·5 cm. diam. Semina bilateraliter compressa, levia, nigra, 0·2 cm. long.

Melochiæ cinerascenti, A. St.-Hil. et Naud., arcte affinis, sed indumento, cymis plurifloris, floribus majoribus, calycis lobis deltoideo-acuminatis nec subulato-filiformibus, petalis longioribus, basi ipsâ (nec abrupte mediocriter) unguiculatis, et staminum tubo puberulo vix conspecifica. [Amazonia.]

WALTHERIA VISCOSISSIMA, A. St.-Hil. Fl. Bras. Merid. i. p. 150.

Hab. Crescit prope Barra da São Lorenzo. (N. 9.) [Bras. Or., Goyaz, Guiana, Nov. Granat.]

GUAZUMA ULMIFOLIA, Lam. Encyc. iii. p. 52.

Hab. Ad Santa Cruz floret mens. Nov. (N. 578.) [Amer. Trop.]

BYTTNERIA CAMPESTRIS (sp. nov.). Arbuscula debilis, spinosa, ramosissima; ramulis patulis, pubescentibus, mox glabris et cinereis, internodiis brevibus, sæpe curvatis; foliis parvis, coriaceo-membranaceis, breviter petiolatis, oblongis, obtusis, basi parum rotundatis, integerrimis, supra glabris, subtus in axillis nervorum præcipuorum barbatis, nervo medio subtus eminente ibidemque juxta basin glandulâ oblongâ vel oblongo-ovali notato; umbellis plerumque solitariis, 2–6-floris (rarissime 1-floris); pedunculis brevibus vel longiusculis; calyce pubescente; petalorum ungue late lineari; alis exiguis, patentibus, subdeltoideis, glabris; ligulâ filiformi, tenui, villosulâ; ovario ovoideo, tuberculato; stigmate obscurissime 5-lobulato.

Hab. Crescit in campis ad ripas fl. Paraguay ad Carandajinho, inter Corumbá et Dourados. (N. 1015.)

Frutex ascendens, spinis minutis disjectis obtectus. Foliorum lamina ad 4·7 cm. long., 1 cm. lat.; costæ secundariæ utrinque 6–8, erecto-ascendentes, rarius leviter fornicatæ, ipso sub margine subito arcuatim-conjunctæ; petioli vix ad 0·4 cm. long., puberuli. Stipulæ minutæ, subulatæ, caducissimæ. Pedunculi ad 0·8 cm. long., filiformes; pedicelli 0·5 cm. vel ultra long., capillares, glabri. Calycis lobi ovato-lanceolati, acuminati, 0·35 cm., long., nervosi. Petala 0·6 cm. long.; unguis 0·15 cm. long. Tubus stamineus 0·1 cm. long., primâ quartâ parte divisa; antheræ 0·05 cm. long., 0·16 cm. lat., approximatæ. Pistillum 0·1 cm. long., ovario duplo longius.

B. filipedi, Mart., proxima, sed habitu ramosissimo, ramulis pubescentibus, spinis minutis, foliis diversiformibus, brevius petiolatis, nequaquam obliquis, basi glanduliferis, necnon flore dispari inter capita alia speciem propriam rite dijudicari. [Bras. Or., Paraguaria.]

BYTTNERIA LEESONI (sp. nov.). Suffruticosa, ramosa, inermis; ramulis 5-angulatis vel 5-quetris, glabris; foliis superioribus solummodo visis, parvis, linearibus, brevipetiolatis, integerrimis, glabris, lævibus; inflorescentiâ ut in *B. ramosissimâ*, Pohl; calycis laciniis ovato-lanceolatis acuminatis, integris; petalorum cucullo obovato; alis pilosis; ligula calycem bene superante, pilosâ; staminodiis tridentatis; ovario globoso, tuberculato, basi incrassato.

Hab. Matto Grosso (*Leeson*, in Herb. Brit. Mus.).

Ramuli rigidi, usque 0·3 cm. diam., in sicco pallide brunei. Folia rigida, modo 1·5 cm. long., vix 0·1 cm. lat., petiolis laminæ æquilatis vix ultra 0·1 cm. long. fulta, basi glandulosa. Pedunculi et pedicelli graciles, usque 0·8 cm. long., hi sæpe sub flore incrassati. Calyx totus 0·5 cm., tubus 0·15 cm. long. Petalorum unguis vix 0·1 cm. long.; cucullus circa 0·1 cm. lat.; ligula 0·7 cm. long., filiformis, basi ampliata. Tubus stamineus 0·13 cm. alt. Staminodia medio dorso dente minuto munita. Pistillum totum 0·15 cm. long. Capsula 0·6 cm. long., 0·7 cm. lat., depressa, globosa, alba, tuberculis acutis, erectis, apice curvatis, fuscis, densiuscule obtecta. Semina 0·4 cm. long., 0·2 cm. lat., pallide grisea, verrucis parvis nigris instructa.

Ab affini *B. ramosissimâ*, Pohl, abhorret foliis alienis, petalorum ligulis multo longioribus et una cum alis pilosis, ovario majore basi incrassato, necnon capsulis aliquatenus diversis. [Goyaz.]

BYTTNERIA MURICATA (sp. nov.). Fruticosa, ramosa, ramis et ramulis spinis abbreviatis parum recurvis sparsim vel sat abunde munitis, his primo minute tomentosis, deinde puberulis vel glabris; foliis omnibus longiuscule petiolatis, late cordatis, nunc obtusis, nunc obtusissimis, membranaceo-coriaceis, palmatim 5–7-nervibus, utrinque scabridis; inflorescentiâ axillari vel terminali; floribus ignotis; capsulâ globosâ, tuberculis pyramidalibus, basi ampliatis, apice spinuloso-acuminatis dense muricata.

Hab. Crescit ad ripas fl. Paraguay inter Santa Cruz et Diamantino, ubi mens. Oct. fructificat. (N. 636.)

Rami teretes, arrecti, juveniles minute tomentosi, mox puberuli, dein scabriusculi et cortice purpureo-cinerascenti crebre longitrorsum rimoso obducti; rami usque 0·5 cm., ramuli 0·1–0·2 cm. diam. Foliorum lamina 7·0–10·0 cm. long., 4·5–11·0 cm. lat. (mediocris 8·5×7·0 cm.), inermis, margine impariter crenulata, raro obscurissime lobulata, utrinque pilis stellatis depressis scabrida, subtus decolor; costæ secundariæ (basalibus exemptis) 4–5, patulo-ascendentes, usque ad marginem rectæ vel fere rectæ, rarius leviter arcuatæ, costas rectas tertii ordinis abundanter emittentes, costæ omnes supra planæ, vix impressæ, subtus eminentes, et basi glanduliferæ vel nonnullæ glandulâ carentes, raro omnes eglanduliferæ; petioli 2·0–4·0 cm. long., minute tomentelli, deinde pubescentes vel puberuli, subquadrangulares, breviter canaliculati, nunc aculeis paucis (1–2) parvis recurvis onusti, nunc inermes. Pedunculus sub fructu incrassatus, 0·5–0·8 cm. long., 0·15 cm. lat. Pedicellus sub fructu pedunculo subæquilongus et subsimilis. Capsula 1·5 cm. long., 1·3 cm. diam., scabrida, tubercula 0·15–0·2 cm. long., basi 5–6-angularis. Semina 0·7 cm.

long., 0·3 cm. lat., subtrigona, apice breviter spinuloso-acuminata, obsolete rugata, brunea; hilum albidum; chalaza purpurea.

Planta forte cum *Byttneriâ catalpæfoliâ*, Jacq., comparanda, specie inermi, cujus folia nequaquam scabrida, pedicelli et capsulæ omnino dispares, etc. [Bras. Or., Amazonia, Peruvia, Venezuela.]

BYTTNERIA CHARAGMOCARPA (sp. nov.). Suffruticosa, sparsim ramosa, inermis; ramis crebre foliatis, leviter undulatis, subteretibus, pubescentibus, deinde glabris; foliis omnibus breviter et patule petiolatis, oblongis vel anguste oblongo-ovatis, obtusis, basi leviter coarctatis, subrotundatis, interdum levissime cordatis, coriaceo-membranaceis, mox, axillis nervorum pag. inf. exemptis, glabris vel fere glabris; costis secundariis 7–10 approximatis distantibusve, angulis latis insertis, rectis vel levissime arcuatis, juxta marginem subito fornicatim-conjunctis, subtus admodum, supra leviter eminentibus; inflorescentiâ abbreviatâ, ex umbellâ solitariâ brevipedunculatâ 4-flora (an semper?) composita, floribus parvis, calycis pubescentis lobis triangulari-lanceolatis, breviter acuminatis; petalorum cucullo late lineari, superne subito amplificato; ligulâ e basi latâ lineari-lanceolatâ, sursum acuminatâ, puberulâ; alis parvis deltoideis incurvis; staminodiis breviter 3-lobulatis; ovario globoso, albido-tomentoso, mox plane tuberculato; stigmate obscure 5-lobulato; capsulâ subglobosâ, tuberculis subcylindricis admodum elevatis, apice clavellatis, densissime obsitâ.

Hab. Schedula prætermissa, locum natalem indicare nequeo, sed verisimiliter crescit ad Santa Cruz vel alibi in viciniâ.

Ramuli 0·2–0·3 cm. diam., grisei, rimis anguste ellipticis abundanter insculpti, intervallis plerumque 1·0–1·5 cm. long. foliigeri. Folia pleraque 7·5–10·0 cm. long., et 3·5–5·0 cm. lat., margine tenuiter cartilaginea ibique obsolete undata; costa media dorso basi glandulifera; petioli plerumque 0·5–0·7 cm. long., patuli, sæpe decurvi, supra breviter canaliculati, pubescentes vel puberuli. Pedunculus sub flore modo 0·25 cm. long., sat validus, puberulus, sub fructu incrassatus et usque ad 1·3 cm. elongatus; pedicelli pedunculo dimidio longiores, puberuli. Calycis lobi circa 0·25 cm. long., nervosi. Floris nondum expansi petala 0·28 cm. long., ungue vix 0·1 cm. long. Tubus stamineus ejusdem floris circa usque ad ½ divisus, et antheræ circa 0·03 cm. long. Pistillum 0·1 cm. long., ovarium solum duplo excedens. Capsula 1·2 cm. long. et lat., minute tomentella, tubercula summa erecta, 0·3–0·5 cm. long., inferiora patula vel decurva et paullo breviora. Semina 0·7 cm. long., 0·4 cm. lat., subtrigona, ferruginea, levia; hilum albidum; chalaza ferruginea.

Species nulli mihi cognitæ affinis, et ob fructum singularem facili obtutu cognoscenda.

TILIACEÆ.

CORCHORUS ARGUTUS, H. B. K. Nov. Gen. et Sp. v. p. 262.

Hab. Inveni juxta Corumbá mens. Jan. (N. 1006.) [Bras. Or., Guiana, Nov. Granat.]

LUHEA UNIFLORA, A. St.-Hil. Fl. Bras. Merid. i. p. 290.

Hab. Floret ad Santa Cruz mens. Nov. (N. 591.) [Bras. Or., Bolivia.]

LUHEA SPECIOSA, Willd. in Neue Schr. Gesell. nat. Fr. Berlin, iii. p. 409.

Hab. Crescit in cacumine montium Serra da Chapada, ubi floret mens. Aug. (N. 139.) [Amer. Trop., Cuba.]

SLOANEA MAXIMOWICZIANA (?), K. Schum. in Mart. Fl. Bras. xii. pars iii. p. 192.

Hab. Viget in ripâ fl. Paraguay inter Santa Cruz et Diamantino. (N. 614.)

The specimens are without flowers, hence I am unable to determine the species with certainty. If not *S. Maximowicziana*, we have here a new species closely allied to it. [Bras. Or.]

LINACEÆ.

ERYTHROXYLON ANGUIFUGUM, Mart. in Abhandl. k. bayer. Akad. Wiss. iii. p. 362.

Hab. Crescit in ripâ fl. Paraguay, haud procul a Tres Barras, mens. Oct. florens. (N. 620.) [Matto Grosso.]

ERYTHROXYLON DAPHNITES, Mart. in Abhandl. k. bayer. Akad. Wiss. iii. p. 363.

Hab. Reperi in angustiis ad Serra da Chapada, ubi floret mens. Aug. (N. 77.)

After spending much time over this plant, I come to the conclusion that the above is its correct name. Mine is a form with long stamens, much longer than in the figures of this species in Mart. Fl. Bras. xii. pars iii. tab. 26. [Goyaz.]

ERYTHROXYLON NITIDUM, Spreng. Syst. Veg. ii. p. 390.

Hab. Reperi ad Santa Cruz mens. Nov. (N. 452.) [Bras. Or., Guiana.]

ERYTHROXYLON CAMPESTRE, A. St.-Hil. Fl. Bras. Merid. ii. p. 97.

Hab. Legi aut ad Cuyabá aut ad Serra da Chapada mens. Aug. (N. 151.)

By an oversight I omitted to note at the time the habitat of this plant. [Bras. Or., Goyaz, Guiana.]

ERYTHROXYLON PRÆCOX (sp. nov.); ramulis gracilibus, brachycladis, ramentis arcte imbricatis instructis; foliis juvenilibus oblongo-ovatis, basi angustatis, apice mucronatis, adultis verisimiliter membranaceis, subtus plicis destitutis; stipulis petiolos paullo excedentibus, crebre striatis, dorso primo ferrugineo-tomentosis, dein glabris, floribus præcocibus, pedicellatis; sepalis parvis 0·12 cm. long.; petalis vix 0·3 cm. long.; drupa . . . .

Hab. Crescit in sylvâ primævâ ad Santa Cruz, ubi floret mens. Sept. (N. 341.)

Frutex paullo ultrametralis, deorsum aphyllus. Rami 0·3–0·4 cm. diam., teretes cortice cinereo longitrorsum rimoso obtecti, ramuli brachycladigeri erecto-ascendentes, circa 0·1 cm. diam. Novelli compressi. Folia vix omnino evoluta 2·0 cm. long., 1·2 cm. lat., glabra, subtus pallida, adulta desiderantur; costa media utrinque prominula, costæ secundariæ plures, debiles, angulo fere recto insertæ; venulæ arcte reticulatæ, supra vix aspectabiles; petioli (an omnino evoluti?) 0·2 cm. long. Stipulæ oblongæ, dorso carinatæ, apice breviter bisetuliferæ, striis pluribus instructæ, subscariosæ, 0·25 cm. long. Ramenta triangulari-lanceolata, inferiora obtusa, dorso brevissime aristata vel nuda, superiora acuminata et basi aristâ dorsali circa 0·1 cm. long. munita, omnia carinata, crebre striata, membranacea. Prophylla 0·1 cm. long., spathulato-oblonga, superne ciliato-erosula ibique dorso pilifera. Pedicelli 0·3–0·5 cm. long., sursum dilatati. Sepala basi connata, tri-

angulari-oblonga, acuta. Petala alba, oblonga, obtusa, ligula duplicata; lobi laterales antici, late ovati, lobo intermedio minimo lancelato rigide acuminato multo longiores; lobi laterales postici anticos semiæquantes, connati, apice inflexi. Tubus stamineus calyci subæquilongus, ore breviter lobulatus; filamenta subæquilonga, tubum stamineum et stylos florum brachystylorum tantum scrutatorum circa 2-plo excedentia. Ovarium oblongo-ovoideum, tubum stamineum æquans; styli 3, discreti; stigmata clavellato-capitata.

Species fortasse juxta *Erythroxylon myrsinite*, Mart., interponenda, ab eo attamen multis signis gravioris momenti insigniter abhorret. [*Bras. Or.*]

Erythroxylon durum (sp. nov.). Fruticosa, ramosa, glabra, ramulis teretibus, sat crassis, in longitudinem eximie rimatis, cinereis, foliis brevipetiolatis, majusculis vel submediocribus, oblongo-obovatis, obtusis vel obtusissimis, basin versus sensim angustatis, rigide coriaceis; stipulis elongatis, lineari-lanceolatis, basi amplexicaulibus, petiolo longioribus; ramentis stipulis conformibus, apice longiuscule apiculatis, superioribus dorso prope basin aristatis; sepalis sub anthesi 0·25 cm. long., sub fructu paullulum (usque 0·3 cm.) auctis, ovatis, breviter acuminatis, medio nervis parallelis approximatis percursis, petalis vix 0·4 cm. long.

Hab. Reperi in sylvâ primævâ prope Santa Cruz, necnon in ripa fl. Brasinho; floret menss. Sept. et Oct. (Nn. 342, 500.)

Frutex diffusus, ramosus. Rami obsoleto-puberuli, mox glabri. Foliorum lamina usque 17·5×9·0 cm., modica 11·0×6·5 cm., supra nitida, subtus pallida; costa media supra impressa, subtus admodum eminens; costæ secundariæ utrinque circa 12, sæpius plus minus undulatæ, dein subito fornicatim-conjunctæ, subtus prominulæ; venulæ laxe reticulatæ, parum eminentes; petioli circa 0·5 cm. long., sat obesi, supra late canaliculati. Stipulæ sagittato-lanceolatæ, dorso bicarinatæ, longitrorsum striatæ, membranaceæ, 0·12 cm. long., apice setis tribus 0·12–0·2 cm. long. instructæ, castaneæ. Ramenta mox laxiuscula, inferiora superioribus multo breviora, illa triangularia, hæc lanceolata et apice tri-setulifera, inferiora dorso breviter aristata vel nuda, superiora basi aristâ vix usque 0·2 cm. long. onusta. Prophylla conferta, ovato-lanceolata, acuminata, subscariosa. Flores nodis bracteatis plurifloris insidentes, et pedicellis ±1·0 cm. long. quadrangularibus fulti. Sepala basi connata, in anthesi 0·2 cm. lat. Petala alba, oblonga, obtusa, circa 0·18 cm. lat.; ligula duplicata, petali laminâ circa duplo brevior; lobi laterales antici concavi, ovati, obsolete undulati, lobum intermedium oblongum bifidum bene superantes; lobi laterales postici anticos semiæquantes, connati, apice inflexi. Tubus stamineus circa 0·12 cm. long., i. e. calycem semiæquans, ore undulato. Florum dolichostylorum a me tantummodo scrutatorum filamenta ejusdem seriei inæquilonga, breviora tubum stamineum $\frac{1}{2}$-plo excedentia, et filamenta longiora sæpissime $\frac{2}{3}$ æquantia. Ovarium subglobosum, tubum stamineum paullo excedens; styli 3, discreti; stigmata capitata. Drupa ovoideo-oblonga, 0·7 cm. long.

Ex affinitate *E. macrophylli*, Mart., abs qua facili obtutu secernendum ob folia minora diversiformia, stipulas longius setuliferas, inflorescentiam disparem, sepala breviora ovata nequaquam flabellatim-nervosa, tubum stamineum calycem semiæquantem neque eo multo breviorem, drupam fere duplo minorem, etc. [Amazonia, Guiana.]

MALPIGHIACEÆ.

Byrsonima verbascifolia, Rich. in Ann. Mus. Paris, xviii. p. 481.

Hab. Ad Serra da Chapada satis abundat, mens. Aug. florens. (Nn. 154, 155.) [Amer. Austr. Trop.]

Byrsonima cydoniæfolia, A. Juss. in A. St.-Hil. Fl. Bras. Merid. iii. p. 77.

Hab. Crescit ad Santa Cruz, ubi floret menss. Sept.–Nov. et Dec. fructificat.

This seems to be the var. *chiquitensis* of Jussieu's Monograph (p. 27).

A very common small tree, of which, by some oversight, I failed to obtain flowering specimens.

Byrsonima cydoniæfolia, A. Juss., var. cuneata, S. Moore, a typo abhorrens foliis lanceolatis deorsum cuneatis, pedunculis et pedicellis gracilibus, his elongatis. An potius species propria?

Hab. Fruticulus $\frac{2}{3}$-metralis; floret ad Jangada mens. Sept. (N. 274.) [Bras. Or., Bolivia.]

Byrsonima coccolobæfolia, H. B. K. Nov. Gen. v. p. 148.

Hab. Ad Santa Cruz flores albos ostendit mens. Nov. (N. 782.) [Amer. Austr. Trop.]

Byrsonima indorum (sp. nov.). Arbuscula, abunde ramosa; foliis brevipetiolatis, anguste obovato-oblongis, raro obovatis, obtusis, nunc brevissime et obtuse cuspidatis, basi acuminatis, tenuiter coriaceis, appresse pilosulis, fere glabris; racemis terminalibus paucifloris, subferrugineo-tomentosis; bracteis bracteolisque approximatis, illis triangulari-oblongis; pedicellis $\frac{1}{2}$-plo brevioribus has rotundato-ovatas 2-plo excedentibus; petalis flavis; antherarum sagittatarum loculis ultra connectivum obtusum brevissime productis una cum ovario piliferis.

Hab. Reperi in ripâ fl. dos Bugres mens. Oct. florentem. (N. 501.)

Rami usque 0·5 cm. diam., teretes, cinerei, rimosi, et lenticelliferi; ramuli appresse hirsutuli, cito glabri. Foliorum lamina supra haud nitida, subtus paullulum decolor, modica 10·0 cm. long., 4·5–6·0 cm. lat.; costæ secundariæ utrinque 8–10 angulis fere rectis insertæ, leviter arcuatæ, marginem versus undulatim et arcuatim conjunctæ, una cum costâ mediâ supra parum subtus maxime eminentes; venulæ arcte reticulatæ utrinque prominulæ; petioli usque 1·0 cm. long., appresse hirsutuli. Racemi 3·0–7·0 cm. long. Bracteæ apice acutæ, dorso appresse puberulæ, 0·2 cm. long. Bracteolæ 0·1 cm. long., obtusæ, puberulæ. Pedicelli 0·3 cm. long., patuli, subferrugineo-tomentosi. Flores expansi (ex schedis meis flavi) desiderantur. Calycis 10-glandulosi lobi ovati, obtusi, puberuli, margine ciliolati, 0·28 cm. long.; glandulæ 0·12 cm. long., oblongo-obovatæ. Petala extus glabra. Filamenta brevissima, dense pilifera; antheræ 0·2 cm. long., 0·06 cm. lat. Ovarium triangulari-ovoideum, vix 0·1 cm. long.; styli crassiusculi, glabri, paullo ultra 0·2 cm. long., apice incurvi. Fructus ignotus.

Forsan cum *Byrsonima intermedia*, A. Juss., et *B. lævigata*, DC., componenda, ab

ambabus revera sat discrepat ob folia necnon bracteas dissimiles. Illius antheræ insuper apice cuspidato-acuminatæ, hujus antheræ necnon ovarium glabrum, etc. [Bras. Or., Amazonia.]

THRYALLIS LABURNUM (sp. nov.). Frutex volubilis, caule sat tenui, subtereti, tenuiter sublutescenti-tomentoso, abunde ramuloso; foliis amplis, petiolatis, late ovatis, obtusis vel acutis, basi rotundatis, supra mox (præter nervos) glabris, subtus tenuiter albo-tomentosis, chartaceo-membranaceis, in sicco virescentibus; floribus ultra 2·0 cm. diam. ex axillis foliorum superiorum ortis et in racemis pauci- vel plurifloris foliis hebetatis seu validis, intermixtis, digestis, aut paniculas terminales plurifloras patulas conficientibus; calycis ampli tenuiter tomentosi segmentis inæqualibus, ovatis vel ovato-oblongis, obtusis; petalis inæqualibus, longe unguiculatis, rotundatis vel rotundato-reniformibus, margine erosulis; staminibus calyce duplo brevioribus; fructibus magnis triquetris, fere 0·5 cm. diam.

Hab. Crescit in nemorosis prope Corumbá, mens. Jan. florescens. (N. 970.) Incolit itaque Brasiliam Orientalem, scilicet provinciam S. Catharinam, unde misit Tweedie (ex spec. in Hb. Kew.) et Fritz Müller (n. 188 in Hb. Kew.).

Ramorum floriferorum caulis 2·0–3·0 cm. diam., demum glaber et subcinereus et in longitudinem ramosus. Foliorum pagina nonnunquam basi parum obliqua, ad 11·0 cm. long. (plerumque vero 8·0–10·0 cm.) et 5·0–6·0 cm. lat. (raro 8·0 cm.), margine obscure undulata, subtus imâ basi (sub apice petioli ipsius) glandulas duas elevatas tomentosas rotundas vel parum ellipticas 0·1 cm. diam. præstans; costæ secundariæ utrinque plerumque 5–8 angulis latis insertæ, primo rectæ, marginem versus subito arcuatim-conjunctæ, una cum costâ mediâ supra impressâ subtus eminentes; venulæ laxe reticulatæ, inconspicuæ; petioli 0·8–1·7 cm. long., pingues, breviter canaliculati, ima basi subito incrassati, molliter tomentosi. Inflorescentiæ axis molliter tomentosâ; racemi foliis breviores, paniculæ pleræque folia superantes; bracteæ caducissimæ, haud visæ; pedicelli graciles, tomentosi, 0·7–1·0 cm. long. Flores 2·5 cm. diam. Calycis segmenta ad 0·85 cm. long., utrinque tenuiter tomentosa, obscure nervosa. Petala lutea, vix 1·0 cm. long., usque ad 0·8 cm. lat., eorum unguis ad 0·6 cm. long., tenuis vel firmior ac (saltem in sicco) fuscior. Antheræ oblongæ, filamentis compressis æquilongæ. Ovarium trigonum, tomentosum, 0·2 cm. diam.; styli glabri, stamina æquantes. Calycis persistentis segmenta sub fructu firma, leviter tomentosa, circa 1·0 cm. long., 0·5–0·6 cm. lat., plana, patentia, intus manifeste reticulato-nervosa; fructus tomentosi cristâ dorsali valde prominente.

Species distinctissima et facile recognoscenda.

Recourse has been had to Tweedie's specimen for the description of the fruit of this beautiful plant.

Hujus stirpis reperi ad Corumbá mens. Jan. (n. 969) varietatem insequentem :—

Var. MINOR, a typo distans habitu (frutex 3 met. alt.) haud volubili (ascendente, an nonnunquam scandente ?), ramulis gracilioribus, foliis minoribus (ad 6·5 cm. long., plerumque vero brevioribus), 2·0–3·5 cm. lat., floribus minoribus (2·0 cm. diam.), calycis lobis et petalis minoribus.

A small specimen in the Herbarium at Kew, collected by Blanchet (no. 3628), is perhaps to be referred to this variety, though its thicker leaves are stellately pubescent on their underside, not tomentose. [Bras. Or.]

GALPHIMIA BRASILIENSIS, A. Juss. in A. St.-Hil. Fl. Bras. Merid. iii. p. 71.

Hab. Floret ad Jangada mens. Sept. (N. 288.) [Bras. Or., Goyaz, Amazonia.]

HETEROPTERIS (§ PTYCHETEROPTERIS ?) NUDICAULIS (sp. nov.); caule erecto, ramoso, tereti, rufo-tomentoso, demum glabro; foliis breviter petiolatis, oblongis, obtusiusculis vel acutis, plerisque brevissime acuminatis, membranaceo-coriaceis, supra appresse pubescentibus, demum glabris et pallide nitentibus, subtus molliter rufo-tomentosis, prope basin brevissime cordatam biglandulosis; umbellis paucifloris (plerumque 2–4-floris) paniculas breves axillares vel terminales foliis subæquilongas efformantibus, et sæpe foliis hebetatis mixtis rufo-tomentosis; prophyllis maxime inæqualibus, ovatis, basi biglandulosis, rufo-tomentosis; bracteis parvis bracteolas æquantibus, pedicellis tenuibus, nequaquam incrassatis, juxta basin articulatis ibidemque bibracteolatis; calycis 8-glandulosi segmentis late oblongis, obtusis, glandulas duplo excedentibus, superne paullo incurvis; petalis ovatis obtusissimis, longiuscule ac crassiuscule unguiculatis; samaris rufo-tomentosis lateribus gibbis planis, alis æquimagnis vel subæquimagnis vel inæqualibus, necnon interdum alâ unâ solummodo evolutâ.

Hab. In fruticetis reperi ad Cuyabá (n. 16) et ad Santa Cruz (Barra dos Bugres) (n. 335). Floret mens. Aug.; fructus (vix maturos ?) præbet mens. Sept.

Frutex gracilis, 1–vix 2 met. alt. e rhizomate pingui erectus, basi aphyllus, sæpe post foliorum casum florens. Folia 3·5–8·0 cm. long. (raro ad apices ramulorum folia minora posita sunt), 1·5–3·5 cm. lat., sæpe subtus ad sinistrum latus glandulâ tertiâ aucta; costæ secundariæ utrinque 5–6, leviter arcuatæ, sub margine conjunctæ, subtus eminentes; venulæ laxe reticulatæ; petioli 0·2–0·4 cm. long., crassiusculi, rufo-tomentosi. Paniculæ pleræque 3·0–4·0 cm. long. (occurrunt vero ad 8·0 cm. long.), subcongestæ; prophylla ad 0·4 cm. long. (ac igitur reverâ in folia hebetata transeuntia), pleraque vero circa 0·2 cm. long. Pedicelli 0·7–1·2 cm. long., subcongesti; bracteæ bracteolæque oblongo-lanceolatæ, rufo-tomentosæ, circa 0·15 cm. long. Flores lutei, 1·0 cm. diam. Calycis segmenta 0·35 cm. long.; glandulæ 0·16 cm. long., anguste ellipticæ; segmentum quintum lineas duas elevatas pro glandulis ostendens. Petala 0·6 cm. long., margine undulata; unguis vix 0·2 cm. long. Ovarium leviter triquetrum, rufo-tomentosum. Samara (vix matura) 1·8 cm. lat., 0·6 cm. long.

Species forsitan juxta *H. confertifloram*, A. Juss., ponenda, sed multis notis dispar.

The Cuyabá specimens are in flower, those from Santa Cruz in the fruiting stage, and except for the former having somewhat larger leaves, less rusty beneath, I can see no difference between them. [Bras. Or.]

Verisimiliter in hoc genus digerenda et juxta speciem præcedentem interponenda exstat planta fruticosa metralis quam ad Santa Cruz legi (n. 336), caule erecto, tereti, superne

tantum foliigero; foliis minimis, subsessilibus, nummulariis, apiculatis, margine revolutis, coriaceis, glabris, 0·8–1·0 cm. long. et lat.; umbellis paucifloris (4), ferrugineo-pubescentibus, in paniculas effusas folia multo excedentes digestis; bracteis parvis, lanceolatis, ferrugineis, circa 0·1 cm. long.; pedicellis gracilibus, centimetralibus vel ultra, ferrugineo-pubescentibus, paullo infra medium articulatis et bracteolis caducis onustis; calycis 8-glandulosi segmentis ovato-oblongis, dorso ferrugineis, 0·23 cm. long.; glandulis oblongis, 0·12 cm. long., filamentis glabris, ovario tomentoso, fructu ignoto.

Ad Serra da Chapada mens. Aug. (n. 81) legi specimen forsan in hoc genus trahendum, foliis lanceolatis acuminatis, basi obtusis, glabris, coriaceis, supra nitidis, subtus pallidis, imâ basi glandulis duabus circularibus 0·04 cm. diam. instructis, 10·0–17·0 cm. long. et 3·5–5·5 cm. lat.; costis secundariis utrinque circa 10, angulis latis insertis, aperte arcuatis, una cum costâ mediâ subtus conspicuis; venulis arcte reticulatis, supra admodum aspectabilibus; petiolis incrassatis, transverse rugatis, 0·5–0·8 cm. long.; paniculis terminalibus, quam folia brevioribus, laxe plurifloris, appresse strigoso-pubescentibus; bracteis bracteolisque parvis, subulatis, 1·0–1·5 cm. long.; pedicellis elongatis, gracilibus, juxta basin articulatis, puberulis, 0·1 cm. long.; floribus luteis; calycis 8-glandulosi lobis oblongis, obtusis, 0·2 cm. long., glandulis oblongis 0·15 cm. long.; petalorum laminâ 0·5 cm. long., 0·3 cm. lat., et ungue 0·1 cm. long.; antherarum dorso strigoso-pubescentium connectivo apice mucronato, loculis 0·25 cm. long., filamentis strigose pubescentibus 0·12 cm. long., ovario sericeo, samarâ ignotâ.

Banisteria pubipetala, A. Juss. in A. St.-Hil. Fl. Bras. Merid. iii. p. 41.

Ad Santa Cruz flores luteos ostendat mens. Dec. (n. 792), itaque ex Matto Grosso a cl. Leeson missa (n. 11 in Herb. Mus. Brit.). [Bras. Or., Goyaz, Amazonia.]

Banisteria constricta, Griseb. in Mart. Fl. Bras. xii. pars i. p. 46.

Hab. Juxta Cuyabá et ed Serra da Chapada satis abundat, mens. Aug. florens et fructificans. (Nn. 15, 104.) [Amazonia.]

Peixotoa hirta, Mart. ex A. Juss. Monog. Malp. p. 176.

Hab. Legi ad Serra da Chapada mens. Aug. (N. 153.)

Samaræ sericeo-tomentellæ, virides, alæ late oblongæ, apice truncatæ et undulatæ, marginibus ambobus rectis vel fere rectis, 2·0 cm. long., 1·2–1·5 cm. lat., crebre nervosæ. [Bras. Or., Goyaz.]

Stigmaphyllon calcaratum, N. E. Br. [in Trans. Bot. Soc. Edinb. xx. (1894) 48].

Hab. Viget in paludibus juxta Corumbá, mens. Jan. florens. (N. 1012.) [Paraguaria.]

Tetrapteris (§ Pentapteris) pilifera (sp. nov.); caule ramoso, ramulis subteretibus, ad nodos parum tumidis, villoso-tomentosis, demum glabris; foliis subsessilibus, oblongo-ovatis, obtusis vel acutis vel brevissime cuspidato-acuminatis, supra pilosis, subtus lanato-villosis, vix tomentosis; corymbis 4-floris, quam folia brevioribus; pedicellis gracilibus, medio articulatis ibidemque bibracteolatis; bracteis lineari-

lanceolatis, bracteolas excedentibus; calycis villosi segmentis lanceolato-oblongis, obtusiusculis, sub fructu glandulas plus quam 2-plo excedentibus; samaræ alis lateralibus 4, discretis, inæqualibus, nunc late obovatis, nunc oblongo-spathulatis, margine eroso-undulatis; alâ dorsali subquadratâ, erosâ, quam laterales breviore.

Hab. Viget in nemorosis ad Santa Cruz, mens. Nov. fructum præbens. (N. 562.)

Frutex incertæ altitudinis, copiose ramosus. Folia ad 8·0 cm. long., medio ad 3·3 cm. lat. basin versus leviter coarctata, margine undulata et basin versus passim glandulifera, membranacea subtus aliquanto decoloria; nervus medius pag. superiore appresse tomentosus pag. inferiore eminens; costæ secundariæ utrinque circa 6, oblique insertæ, erecto-ascendentes, parum aspectabiles; venulæ subobsoletæ. Petiolus 0·2–0·25 cm. long. lanato-villosus, ad apicem faciei superioris glandulis duabus rubellis parvis (vix 0·05 cm. long.) gaudens. Pedicelli 1·1–1·3 cm. long., lanato-villosi. Bracteæ lineari-lanceolatæ, dorso lanato-villosæ, inferne glanduloso-bidenticulatæ, 0·3 cm. long. Bracteolæ bracteis similes nisi minores, 0·2 cm. long. Flores desunt. Calycis segmenta sub fructu 0·4 cm. long.; glandulæ 0·2 cm. long., ellipticæ, superne coarctatæ. Fructus circa 2·5 cm. diam. Samaræ rubellæ alæ laterales majores 0·9 cm. long., 0·8 cm. lat.; minores majoribus æquilongi, 0·5 cm. lat.; alâ dorsalis 0·5 cm. long., 0·6 cm. lat.; alæ omnes papyraceæ, eximie nervatæ.

Ex affinitate *Tetrapteridis metallicoloris*, A. Juss., sed aliquot notis dispar.

I have ventured to describe this plant, although the only specimen which has survived is without flowers. A plant of Burchell's collecting (n. 5754 in Herb. Kew.) should perhaps be referred to this species. [Bras. Or.]

Tetrapteris (§ Pentapteris) præcox (sp. nov.); caule ramoso, tereti, lanato-tomentoso, demum glabro, cortice fusco-cinereo crebre lenticellifero obtecto; foliis petiolatis (ut apparet) ovatis seu ovato-oblongis, margine obscure undulatis, chartaceis, supra glabris, subtus tomentoso-pilosis; ramis sæpe umbellis præcocibus instructis, umbellis lateralibus plerumque 2–6-floris; pedunculis sæpissime subsessilibus, prophyllis pluribus parvis linearibus sericeis instructis; pedicellis gracilibus, pedunculo multoties longioribus, supra medium articulatis et juxta medium bibracteolatis; bracteis parvis linearibus, bracteolis conformibus; calycis sericeo-velutini segmentis lanceolato-ovatis, quam glandulæ vix duplo longioribus; petalis inæqualibus, unguiculatis, ovatis vel panduriformibus, apice retusis; samaræ alis lateralibus omnino disjunctis, subæqualibus, late linearibus, retusis vel margine apicali eroso-undulatis, alâ dorsali lateralibus subsimili, sed plus quam duplo breviore.

Hab. Juxta urb. Cuyabá abundat, et mens. Aug. flores necnon fructus vix maturos præbet. (N. 17.)

Frutex prolixus, circa 1 met. alt., inferne aphyllus. Folia, ut videtur, ad circa 5·5 cm. long. et 3·0 cm. lat.; petiolus ad 0·6 cm. long., lanato-tomentosus, sat pinguis, glandulas 3 parvas in sicco atras et nitentes circa 0·015 cm. long. gerens. Pedunculi raro ad 0·5 cm. long., recti, sericei; prophylla vix ultra 0·15–0·2 cm. long. Bracteæ usque ad 0·38 cm. long., una cum bracteolis 0·2 cm. long. sericeæ. Pedicelli 1·0–vix

1·5 cm. long., subcongesti, sericei; eorum bracteæ 0·2–0·3 cm. long. Flores lutei, circiter 1·0 cm. diam. Calycis segmenta acutiuscula, 0·4 cm. long.; glandulæ anguste ellipticæ, margine rugatæ, 0·2–0·25 cm. long. Petala 0·5–0·7 cm. long., eorum unguis ad 0·15 cm. long., nunc crassus, nunc tenuis. Ovarium sericeum, subglobosum, circa 0·22 cm. diam.; styli crassi, puberuli. Samaræ sericeo-tomentosæ, vix maturæ, alæ laterales ad 0·7 cm. long., 0·25 cm. lat.; ala dorsalis 0·3 cm. long.; omnes fere omnino glabræ, virescentes, papyraceæ, in longitudinem crebre nervosæ.

Cum *Tetrapteridi ramiflorâ*, A. Juss., comparanda, specie mihi descriptione tantum cognitâ, sed ob pedunculos copiose prophyllis instructos, pedicellos elongatos, etc., certe distincta.

This is one of the commonest plants round Cuyabá, but I had to search some time before finding flowering shoots still bearing leaves, and then the latter were in a very imperfect state. [Bras. Or.]

Hiræa (§ Mascagnia, Pleuropteris) nitens (sp. nov.); caule terete, cinereo vel fusco-cinereo, glabro; foliis breviter petiolatis, ovatis vel ovato-oblongis, obtusis vel obtuse acutis, nonnunquam leviter cuspidatis, basi rotundatis vel levissime coarctatis, coriaceis, glabris, nitentibus, eglandulosis; floribus breviter racemosis vel paniculatis, paniculis congestis, subthyroideis; prophyllis minutis; pedicellis infra medium minute bibracteolatis; bracteis bracteolis similibus; calycis 8-glandulosi segmentis late oblongis, obtusiusculis, quam glandulæ haud duplo longioribus; samaris (an maturis?) parvis, dorso eximie carinatis et argute scrobiculatis, alis oblongis, margine inciso-undulatis.

Hab. In convalle ad Serra da Chapada mens. Aug. fructus gerens. (N. 74.)

Frutex scandens, a basi foliatus. Folia ad 15·0 cm. long. (plerumque 8·0–11·0 cm.), 4·0–6·0 cm. lat., reticulato-nervosa; petioli 0·5–0·8 cm. long., crassi, juxta medium glandulas duas parvas ellipticas in sicco fuscas vix 0·2 cm. long. præbentes. Costæ secundariæ circa 8, angulis latis plerumque insertæ (inferiores raro erecto-ascendentes), aperte arcuatæ, deinde margine parallelæ et maxime undulatæ; venulæ arcte reticulatæ, utrinque conspicuæ. Inflorescentiæ axis appresse pubescens, demum glaber. Panicula terminalis ad 5·0 cm. long., inferne vix 5·0 cm. diam. Prophylla et bracteæ subulatæ, illa 0·15 cm., hæ 0·1 cm. long. Pedicelli 0·8–1·0 cm. long., pubescentes. Calycis segmenta rufulo-tomentosa, vix 0·3 cm. long., glandulæ vix 0·2 cm. long., anguste ellipticæ. Petala haud visa. Ovarium subtrigonum, tomentosum; styli glabri, ovario breviores. Samaræ (an maturæ?) 0·7 cm. long. et lat., membranaceæ, virescentes.

Ex affinitate *H. chlorocarpæ*, A. Juss., abs quâ ob foliorum formam et magnitudinem pluria inter propria eximie discrepat; videtur itaque ad *H. hippocrateoidem*, Planch. et Triana, accedere, sed foliis latioribus, petiolis biglandulosis, inflorescentia sæpe racemiformi, bracteis minutis, etc., certe ab illa diversa. [Bras. Or., Nov. Granat.]

Hiræa (§ Mascagnia, Eumascagnia) volubilis (sp. nov.). Frutex volubilis, caulibus teretibus, pubescentibus, demum fere glabris, in longitudinem rimosis; ramulis abunde foliosis, rufo-tomentosis; foliis petiolatis, obtusis vel acutis vel breviter acuminatis,

basi rotundatis, nervo medio excurrente apiculatis, supra piloso-pubescentibus, demum præter ad nervos glabris, subtus piloso-pubescentibus, membranaceis, eglandulosis; petiolis rufo-tomentosis, utrinque basi glandulâ auctis; inflorescentiâ axillari vel terminali, corymbosâ, vel floribus in paniculas paucifloras corymbiformes dispositis; pedicellis gracilibus, juxta medium minute bibracteatis; calycis 8-glandulosi segmentis glandulas haud superantibus; petalis ovato-oblongis, breviter unguiculatis; samaris albo-tomentosis, immaturis, alâ dorsali parvâ, laterali samaram cingente amplâ suborbiculari.

Hab. In nemorosis viget ad Santa Cruz, menss. Sept.–Nov. florens. (Nn. 340, 647.)

Caulis 2·5–3·0 cm. crass., purpureo-bruneus. Folia pleraque 7·5–9·0 cm. long. (raro ad 10·0 cm.), plerumque 4·0–7·0 cm. lat., margine ciliata, pagina super. ad nervum medium plus minus appresse pubescenti-tomentosa, pagina infer. pallida, nervis aliquanto elevatis plus minus pubescenti-tomentosis; petioli 0·7–1·5 cm. long., pingues, glandulis late ellipticis vel fere orbicularibus 0·1 cm. diam. Pedunculi rufo-tomentosi, plerumque 1·0–3·0 cm. long. Prophylla subulata, rufo-tomentosa, circa 0·2 cm. long. Pedicelli plerique circa 1·0 cm. long., subcongesti, rufo-tomentosi, bracteæ prophyllis subsimiles. Flores rosei, circa 1·2 cm. diam. Calycis segmenta 0·3 cm. long., ovata, obtusa, pubescentia; glandulæ ellipticæ, calycis segmentis æquilongæ. Petala 0·6 cm. long. et 0·45 cm. lat., nervo medio in sicco eminente; unguis modo 0·1 cm. long., sat pinguis. Ovarium trigonum, albo-tomentosum; styli vix omnino glabri. Samaræ immaturæ circa 0·6 cm. long. et 0·5 cm. lat., ala dorsali circa 0·1 cm. alt.

Species accedens ad *Hiræam rubram* (*Mascagniam*, Griseb.), quæ forsan ad sectionem *Eumascagniam* transferri debet, sed foliorum crassitudine ac vestitu, corymbis brevibus nec solis terminantibus, pedicellis brevioribus, bracteis omnino diversis, etc., optime divergens.

HIRÆA SEPIUM, A. Juss. in A. St.-Hil. Fl. Bras. Merid. iii. p. 19.

Hab. Ad Santa Cruz flores et fructum simul ostendit mens. Nov. (N. 520.)

HIRÆA SEPIUM, A. Juss., var. NITENS, S. Moore, foliis quam ea typi firmioribus supra nitidis et puberulis, samaris ignotis.

Hab. Ad Corumbá floret mens. Jan. (N. 1008.)

Quum samaras non examinavissem, exstitit quædam quæstio num mera pro varietate haberi debeat. [Bras. Or.]

HIRÆA CUJABENSIS ?, Griseb. in Mart. Fl. Bras. xii. pars i. p. 100.

Hab. Crescit in loco ignoto, verisimilter ad Santa Cruz.

The specimen is very incomplete, and, owing to the loss of the label accompanying it, I am unable to give its locality. [Matto Grosso.]

HIRÆA (§MASCAGNIA) (sp. nov.); foliis et floribus ignotis; samaris magnis, papyraceis, glabris, viridibus, alâ dorsali 2·0 cm. long. et usque ad 1·3 cm. lat., alis lateralibus late obovatis, truncatis, margine superiore dentato-undulatis, 3·0 cm. long. et lat.

Hab. Matto Grosso (*Leeson*, in Herb. Brit. Mus.).

A fine species, with fruits much like those of *Hiræa glaucescens*, Griseb., but much larger. Perhaps it is still nearer the Mexican *H. macroptera*, DC.

CAMAREA ERICOIDES, A. St.-Hil., Pl. Rem. i. p. 158.

Hab. Crescit ad Jangada, mens. Sept. florens. (N. 286.) [Bras. Or.]

Specimina manca reverâ fructibus carentia, quâpropter quoad genus omnino dubia:—

(i.) Volubilis, caulibus foliosis, strigose pubescentibus, cito glabris; foliis oblongo-ovatis, obtusis obtusissimisve, nonnunquam retusis, basi rotundatis, supra glabris, haud nitentibus, subtus pilis strigosis arcte appressis vestitis, tenuiter coriaceis, 5·0–10·0 cm. long., 3·0–5·0 cm. lat.; petiolis 0·5–0·7 cm. long., appresse et strigose puberulis, basi biglandulosis insidentibus; costis secundariis utrinque 8–10, primo fere rectis, dein dichotomis et arcuatim junctis; paniculis terminalibus axillaribusve (et tunc ex axillis superioribus ortis), quam folia multo brevioribus (2·0–3·5 cm. long.), appresse ferrugineo-hirtulis, in umbellas brevipedunculatas plerumque 3–4-floras digestis; prophyllis lanceolatis, ferrugineo-hirtulis; bracteis bracteolisque approximatis, lanceolatis, illis has duplo excedentibus et vix 0·2 cm. long.; pedicellis 0·4–0·6 cm. long.; calycis 8-glandulosi segmentis oblongis dorso ferrugineo-hirtis 0·25 cm. long., glandulis nunc minimis, nunc usque ad 0·16 cm. long., oblongis; petalis luteis, filamentis glabris, ovario tomentoso.

Hab. Reperi juxta Corumbá mens. Jan. florentem. (N. 945.)

(ii.) Fruticosa ? ramosa, ramis subteretibus, strigose pubescentibus, mox glabris; foliis ovatis, breviter acuminatis, rarius cuspidulatis, basi rotundatis, nunc utrinque glabris, supra haud nitidis, subtus pallidioribus, imâ basi biglandulosis, 7·5–9·0 × 4·0–5·0 cm.; petiolis vix usque 1·0 cm. long., villosulis, cito glabris, inflorescentiis terminalibus axillarisbusve; floribus nunc racemosis, nunc in umbellas paucas 2–4-floras brevipedunculatas paniculatim digestis, semper quam folia brevioribus nec ultra 6·0 cm. long.; bracteis 0·25 cm. long., lanceolatis, pedicellos ferrugineo-hirtulos semiæquantibus; bracteolis sub flore insertis ovatis, obtusis, basi biglandulosis, 1·5 cm. long.; calycis 8-glandulosi segmentis oblongis, obtusis, dorso appresse hirtulis, 0·3 cm. long., glandulis oblongis subæqualibus usque ad 0·25 cm. long.; filamentis glabris; ovario tomentoso.

Hab. Ad Corumbá floret mens. Jan. (N. 1095.)

(iii.) Fruticosa, deorsum aphylla, ramis erecto-ascendentibus, subteretibus, cinereo-purpurascentibus; foliis oblongis vel oblongo-lanceolatis, obtusis, basi parum coarctatis, utrinque (costâ mediâ subtus brevissime albido-sericeo-tomentellâ exemptâ) glabris, coriaceo-membranaceis, subtus nitentibus, costis secundariis utrinque circa 10 fere rectis, deinde margini parallelis, subtus conspicuis, costis tertii ordinis plurimis maxima pro parte secundariis plus minus perpendicularibus; petiolis circa 0·5 cm. long., sericeo-tomentellis, sursum glandulis duabus pedicellatis onustis; floribus umbellatis, umbellis abbreviatis, 3–4-floris, 1·5 cm. long., sericeo-tomentellis; bracteis bracteolisque minutis, approximatis, æqualibus, ovatis, sericeis; pedicellis 0·7 cm.

long. et reverâ pedunculum vix 2-plo excedentibus; calycis 8-glandulosi segmentis ovatis, obtusis, dorso sericeis, 2·3 cm. long., glandulis ellipticis 0·1 cm. long.; filamentis pilosulis; ovario trilobo tomentoso.

Hab. Verisimiliter inveni ad Santa Cruz, ob schedulam vero prætermissam locum accurate indicare nequeo.

GERANIACEÆ.

OXALIS HIRSUTISSIMA, Zucc. Monog. Amer. Oxal. p. 179.

Hab. Ad Santa Cruz floret mens. Nov. Nom. vernac. *Azedinha.* (N. 608.)

Frutex altus, interdum orgyalis. Flores lutei. Capsulæ virides, ovoideæ, angulis appresse hirtulæ, 0·6 cm. long. Semina elliptica, 0·15 cm. long., transverso-rugata, brunea. [Bras. Or.]

OXALIS SEPIUM, A. St.-Hil. Fl. Bras. Merid. i. p. 111, var. PICTA.

Hab. Crescit ad Jangada necnon ad Santa Cruz, menss. Sept.-Nov. florens. (Nn. 263, 328, 561, 645.) [Bras. Or., Guiana, Ind. Occ.]

OXALIS CATHARINENSIS, N. E. Br. in Gardn. Chron. 1887, I. p. 140.

Hab. Crescit in sylvulis umbrosis juxta Corumbá, ubi flores albos mens. Jan. præbet. (N. 967.)

My specimens differ from the type (F. Mueller, no. 395, in Herb. Kew.) in having somewhat sharper-angled leaves. In cultivation this beautiful little plant woefully deteriorates, possibly in consequence of exposure to light of too high intensity; in its native woods, at least at Corumbá, it prefers the darkest recesses. [Bras. Or.]

RUTACEÆ.

MONNIERIA TRIFOLIA, Linn. Syst. Nat. ed. X. p. 1153.

Hab. Crescit in sylvâ primævâ inter Santa Cruz et Tapirapuan, itaque ad ripas fl. Paraguay inter Santa Cruz et Diamantino. (Nn. 396, 625.) [Bras. Or., Amazonia, Guiana, Nov. Granat.]

SIMARUBACEÆ?

Planta incertæ sedis, forsan inter Simarubaceas difficile digerenda. Arbuscula, ramulis teretibus striatis, cortice cinerascente amaro cincta; foliis alternis imparipinnatis, foliolis 8–10 alternatim insertis, oblongo-obovatis, basi longe et sensim cuneatis; acuminatis, glabris, utrinque nitidis, creberrime et minute glanduloso-punctatis, spicis elongatis, exaxillaribus vel ex axillis foliis orbis ortis, simplicibus, raro bifurcatis; calyce 5-partito; petalis cum calycis lobis alternantibus, staminibus . . .; ovario omnino integro, 2-loculari, stigmatibus 2 brevibus sessilibus divaricatis coronato, ovulis quove in loculo 2, ab apice pendulis; raphe ventrali, micropyle superiore; baccis oblongis, 1–2-locularibus, loculis abortu 1-spermis; seminibus testâ tenui arcte adhærente obtectis, exalbuminosis; cotyledonibus carnosis, radiculâ inconspicuâ.

Hab. Reperi in ripâ fl. Paraguay inter Santa Cruz et Tres Barras, ubi floret mens. Oct. (N. 491.)

Rami spicigeri, crassi, usque ad ultra 1·0 cm. diam. Foliorum rhachis 23·0–37·0 cm. long., 0·2 cm. diam., rigida, subtetragona, intervallis 2·0–3·5 cm. long. folioligera. Foliola 12·0–16·0 cm. long. (raro usque ad 8·0–10·0 cm. miniata), 4·5–6·0 cm. lat., firme membranacea, subtus pallidiora, petiolis crassiusculis in sicco rugatis 0·3–0·6 cm. long. insidentia; costæ secundariæ utrinque circa 8, plerumque angulis latis insertæ, aperte arcuatæ. Spicæ pendulæ, usque ad 27·0 cm. long. (exstant nonnullæ vero sæpe 10·0–16·0 cm. long.), 1·5–2·0 cm. diam., rigidæ, minute pubescentes, imâ basi incrassatæ. Bracteæ nobis haud suppetunt. Flores pedicellis brevibus, crassiusculis, subtetragonis, 0·1–0·15 cm. long. fulti. Calycis lobi ovati, obtusi, puberuli, circa 0·1 cm. long. Petala calycem paullo excedentia. Ovarium oblongo-ovoideum, sursum angustatum, arcte tomentosum, 0·25 cm. long. Stigmata ligulata, obtusa, 0·004 cm. long. Baccæ oblongo-ovoideæ, 0·8 cm. long., 0·6 cm. diam., primo coccineæ, deinde nigræ.

In general appearance this plant resembles a *Picramnia*, but the gland-dotted leaves are peculiar, and may indicate a Rutaceous affinity. Unfortunately, mature flowers are not present, hence the impossibility of definitely placing the plant.

OCHNACEÆ.

Ouratea purpuripes (sp. nov.). Fruticosa, ramulis gracilibus, teretibus, glabris, cortice papyraceo brunescente vel cinerascente obtectis; foliis mediocribus, tenuiter coriaceis, glaberrimis, oblanceolatis vel oblanceolato-oblongis, basi coarctatis, margine serrulatis, petiolis brevibus crassiusculis insidentibus; costâ mediâ utrinque prominente, costis secundariis parum conspicuis, utrinque circa 10–12, aperte arcuatis; venulis pluribus horizontalibus, raro dichotomis; paniculis terminalibus axillaribusve, quam folia brevioribus, racemiformibus, paucifloris, eorum ramulis verisimiliter ebracteatis, fuscis, minute pubescentibus; pedicellis gracilibus, alabastra ovoidea acutiuscula subæquantibus; sepalis inæqualibus, oblongis vel ovato-oblongis; petalis obovato-oblongis, basi late cuneatis, antheras bene excedentibus; antheris lineari-oblongis, breviter acuminatis, rugulosis; gynophoro ovario æquilongo; stylo incrassato, ovarium 4-plo excedente; drupâ solitariâ (an semper?), anguste ovoideâ, gynophorum ovoideum triplo excedente.

Hab. Reperi in ripâ fl. Paraguay juxta Santa Cruz mens. Oct. florentem et fructificantem. (N. 512.)

Ramuli 0·1–0·3 cm. diam., intervallis plerumque 1·0–3·0 cm. long. foliigeri. Folia pleraque 7·0–10·5 cm. long., 2·0–3·5 cm. lat., nitidula, subtus pallidiora, creberrime ac minutissime pellucido-punctata, margine breviter cartilaginea, basi integra; petioli crassiusculi, superne late excavati, dorso transverse rugati, 0·3 cm. long. Stipulæ ovato-lanceolatæ, acuminatæ, 0·35 cm. long. Paniculæ circa 4·0 cm. long., basi semel ramosæ vel ad meros racemos reductæ. Pedicelli sæpe bini vel terni, ascendentes, sub flore 0·4 cm. long. Alabastra 0·5 cm. long. Sepala 0·4–0·45 cm. long., 0·2–0·25 cm. lat., margine nunc late, nunc vix scariosa. Petala vix omnino matura 0·5 cm. long., basi 0·17, superne 0·3 cm. lat. Antheræ 0·3–0·35

cm. long., basi 0·5 cm. lat., apice ipso flavescentes, ceteroquin aurantiaco-rubescentes. Gynophorum pentagonum, 0·06 cm. long., sub fructu purpureus, 0·3 cm. long. et 0·25 cm. diam. Stylus 0·24 cm. long. Drupæ vix 0·9 cm. long., 0·5 cm. diam., basi ipsâ breviter attenuatæ, politæ, vivæ virides.

Speciei nulli mihi cognitæ affinis, et imprimis venatione, foliis mediocribus utrinque glaberrimis, tenuiter coriaceis, margine serrulatis, inflorescentiâ racemiformi, pedicellis et alabastris æquilongis facili negotio recognoscenda.

Huic affinis, ab ea racemorum et pedicellorum indumento discrepans, petalis majoribus, antheris longioribus, drupis parvis binis gynophoro subgloboso roseo insidentibus, exstat insequens :—

Ouratea rosipes (sp. nov.). Fruticosa, ramulis sat validis, teretibus, cortice crustaceo-cinereo obductis; foliis glaberrimis, breviter petiolatis, tenuiter coriaceis, oblongis vel oblongo-oblanceolatis, obtusis, deorsum cuneatim angustatis, margine inferne integris, superne serrulatis, costâ mediâ utrinque prominente, costis secundariis ægre aspectabilibus intrusis latere circa 12 aperte arcuatis, demum margini parallelis, interjectis costis pluribus tertii ordinis subparallelis, crebre ramosis; inflorescentiâ racemosâ (an semper ?), axillari vel terminali, foliis breviore, basi bracteatâ paucìflorâ, fulvo-tomentosâ, dein puberulâ, pedicellis fulvo-tomentosis, alabastris oblongis obtusis æquilongis; sepalis inæqualibus, oblongis vel ovato-oblongis, plus minus scariose marginatis; petalis obovatis, basi late cuneatis, antheras subæquantibus; antheris linearibus, acuminatis, rugulatis; gynophoro ovario vix æquilongo, stylo filiformi, ovarium triplo excedente; drupis binis ovoideis, gynophorum subglobosum duplo excedentibus.

Hab. Ad Santa Cruz mens. Oct. floret et fructificat. (N. 364.)

Frutex diffusus, ultrametralis. Ramuli erecti, usque ad 0·4 cm. diam. Folia 7·5–11·0 cm. long., 2·0–3·5 cm. lat., utrinque nitidula, subtus parum decoloria, minute pellucido-punctata, margine breviter cartilaginea; petioli 0·2 cm. long., superne excavati, dorso rugati. Stipulæ firmæ, lanceolatæ, 0·2–0·25 cm. long., in sicco fuscæ. Racemi usque 3·0 cm. long., bracteæ stipulis similes. Pedicelli et alabastra 0·4 cm. long., hæc basi 0·22 cm. lat. Sepala 0·5 cm. long., 0·2–0·3 cm. lat., apice obtusa vel acutiuscula, dorso minute pubescentia. Petala inæqualia, 0·6–0·7 cm. long., ima basi 0·12 cm. lat., superne usque 0·4 cm. lat. Antheræ 0·5–0·6 cm. long., in sicco, apice flavescente exempto, fusco-bruneæ. Gynophorum subpentagonum 0·08 cm. long., sub fructu roseum, 0·3 cm. long. Ovarium 0·1 cm. long., 0·13 cm. diam. Stylus 0·32 cm. long. Drupæ 0·5–0·7 cm. long., 0·4–0·5 cm. diam., nitidulæ, vivæ virides.

Ouratea Riedeliana, Engl. in Mart. Fl. Bras. xii. pars ii. p. 322.

Hab. Ad Cuyabá satis abundat, reperi itaque ad Santa Cruz. Floret menss. Sept.–Nov. (Nn. 24, 474.)

The Santa Cruz plant has larger and more deeply serrated leaves than those of the type: the leaves attain a length of 14 centimetres; and the nerves also are more plainly marked. [Bras. Or.]

OURATEA ORGYALIS (sp. nov.). Erecta, glaberrima, ramulis subtetragonis, cortice cinereo obtectis; foliis coriaceo-membranaceis, oblongo-oblanceolatis, obtusissimis vel obtusis, basi acutis, margine (parte infimâ integrâ exemptâ) impariter spinuloso-serrulatis, petiolis brevibus fultis; costis secundariis utrinque circa 10, plus minus fornicatis, demum margini parallelis, supra eminentibus, venulis perplurimis rarius anastomosantibus, magnâ pro parte costis secundariis perpendicularibus vix prominulis; stipulis parvis lineari-lanceolatis acuminatis; paniculâ terminali anguste thyrsoidea, ejus ramulis superioribus abbreviatis, ramis omnibus subsimplicibus et paucifloris; pedicellis tenuibus, alabastra paullulum superantibus; petalis late obovatis, dimidio inferiore gradatim cuneatis; antheris attenuatis, rugulosis, inæquilongis, longioribus, quam petala paullo brevioribus; ovario 5-gyno, gynophoro brevi insidente; carpidiis ovoideis; stylo superne sensim angustato, antheras haud superante.

Hab. Ad Santa Cruz floret mens. Nov. (N. 455.)

Frutex prolixus, erectus, orgyalis, caule gracili, apice solummodo foliigero. Ramuli pauci, ascendentes, 0·2–0·3 cm. diam. Folia et flores iisdem temporibus geniti, illa 12·0 cm. long., vix 4·0 cm. lat., supra nitidula, subtus pallidiora; petioli 0·3 cm. long., crassiusculi, supra canaliculati; stipulæ 0·8 cm. long., crebre nervosæ. Panicula 14·0 cm. long., inferne circa 4·0 cm. lat., mox usque ad 2·0 cm. attenuata. Pedicelli 0·8 cm. long. Alabastra anguste ovoidea, acuta, 0·6 cm. long., 0·3 cm. lat. Sepala oblonga, sub apice breviter mucronulata, 0·75 cm. long., exteriora crassiuscula, interiora margine scariosa. Petala 0·75 cm. long., summum 0·6 cm. lat. (ima basi vix 0·1 cm. lat.), margine undulata vel crenellata. Antheræ longiores 0·6 cm., breviores vix 0·45 cm. long., omnes tenues et fere a basi sensim angustatæ. Gynophorum abbreviatum, crassum, circa 0·04 cm. alt. Carpidia 0·07 cm. et stylus vix 0·5 cm. long. Bacca ignota.

Sine dubio præcedenti admodum affinis, etiam cum *O. hexasperma*, Baill., rite componenda; ab ambabus attamen insigniter distat ob folia floribus coætanea, inflorescentiam anguste thyrsoideam, et antheras inter se inæquales. Folia hujus insuper obsolete serrata, et stipulæ duplo longiores, panicula densiflora, pedicelli necnon styli longiores, illa contra flores majores alabastra abbreviata obtusa, antheras nec ultra 0·35 cm. long., præbet. [Bras. Or., Goyaz.]

OURATEA SIMULANS (sp. nov.); ramis glaberrimis, subtetragonis, sat validis, in sicco bruneis; foliis elongatis, brevipetiolatis, lineari-lanceolatis, acute acuminatis, basi obtusis, fere toto margine crebre serrulatis, coriaceis, glaberrimis, costâ mediâ lata, paginâ superiore basi impressa, superne eminente, subtus prorsus prominula, costis secundariis perplurimis utrinque impressis; paniculis terminalibus vel ex axillis summis ortis, earum ramulis plurifloris patentibus subtetragonis; pedicellis abbreviatis, alabastra ovoidea acuminata haud excedentibus; sepalis oblongis obtusis; petalis late rhombeo-obovatis, basi longe cuneatis, quam sepala paullo longioribus; antheris rugulatis, petala $\frac{5}{6}$ æquantibus; gynophoro ovarium subæquante; stylo quam stamina paullo breviore; drupâ subcylindricâ, in sicco bruneâ, nitidâ.

Hab. Legi in ripâ R. Paraguay juxta Santa Cruz, ubi mens. Oct. floret et fructificat. (N. 461.)

Frutex elatus. Foliorum lamina usque ad 30·0 cm. long. et 7·0 cm. lat. (mediocris 22·0 × 6·0 cm.), utrinque pallide nitens, subtus vero decolor, in sicco lutescenti-brunea, sæpe plus minus, more *Erythroxyli Coca*, Lam., et specierum *Triplaridis*, longitrorsum striata; petioli crassi, alte canaliculati, 0·6–0·9 cm. long., 0·25 cm. lat., dorso transverse rugosi. Paniculæ thyrsoideæ, usque 12·0 cm. long., basi plerumque 4·0–7·0 cm. lat., ramulis plerisque 2·0–5·0 cm. long., plurifloris; pedicelli graciles, circa 0·4 cm. long. Alabastra paullulum ante floritionem 0·5 cm. long., 0·4 cm. lat. Sepala 0·5 cm. long., juxta medium 0·2 cm. lat., margine breviter scariosa. Petala 0·6 cm. long., usque 0·5 cm. lat. Antheræ 0·5 cm. long., apiculo in sicco flavescente, ceterum bruneæ. Gynophorum 0·05 cm. long. Ovarium 0·06 cm. long., stylo 0·4 cm. long. coronatum. Gynophorum fructiferum subcylindricum, admodum curvatum, 0·5 cm. long. et 0·3 cm. diam. Drupæ 1·0 cm. long. vel paullulum ultra, 0·6 cm. lat., læves.

Mihi videtur *Ourateæ tenuifoliæ*, Engl., proxima, abs quâ foliis longe aliis, alabastris majoribus, petalis latioribus, antheris longioribus inter alia optime abhorret.

This species is remarkably homoplastic with the Amazonian *O. verruculosa*, Engl., so much so that it would be difficult to distinguish the two without flowers. In the flowering state, however, there is much difference. A precisely similar homoplasy will be mentioned when treating of the genus *Psychotria* (see p. 379). [Amazonia.]

MELIACEÆ.

GUAREA SYLVESTRIS (sp. nov.); foliis longiuscule petiolatis, 3–5-jugis, foliolis oppositis, petiolulatis, oblongis vel oblongo-lanceolatis, cuspidato-acuminatis, basi acutis, supra glaberrimis, subtus, costis appresse pubescentibus, mox minute puberulis exceptis, glabris; petiolulis una cum rhachi tomentosis, cito puberulis; paniculis brevipedunculatis, simplicibus, quam folia multo brevioribus; alabastris late oblongis; floribus tetrameris, calycis cupuliformis extus puberuli vel pubescentis ore impariter 4-dentato; petalis breviter sericeo-tomentosis, in sicco haud rubescentibus; tubo stamineo cylindrico, crenellato; ovario subgloboso, gynophoro æquilongo, dense albido-sericeo.

Hab. Crescit in sylvâ primævâ inter Santa Cruz et Tapirapuan. (N. 400.)

Arbuscula (ex schedis meis), forsan potius frutex altus trimetralis, trunco gracili. Ramuli cinerascentes, juveniles griseo-tomentosi, dein puberuli, crebre striati, 0·4 cm. diam. Foliorum rhachis 24·0 cm. long. Foliolorum juga inæqualia, foliola basalia 7·0–11·0 cm. long., superiora 15·0–18·0 cm. long., 4·2–5·0 cm. lat., creberrime ac minutissime pellucido-punctata, coriaceo-membranacea; costæ secundariæ utrinque circa 10, angulis latis insertæ, aperte arcuatæ, dein margini parallelæ, una cum costâ mediâ subtus prominulæ; venulæ arcte reticulatæ, utrinque, præsertim vero subtus, conspicuæ. Petioluli incrassati, rugati, 0·5 cm. long. Petioli 0·7–0·9 cm. long., superne late canaliculati. Paniculæ 7·0–12·0

cm. long., minute pubescentes; cymulæ pedicellis 0·3–0·5 cm. long. fultæ. Flores virides, 0·5 cm. long., pedicellis 0·1 cm. long. insidentes. Calyx 0·1 cm. long. Petala vix 0·5 cm. long., lineari-oblonga, obtusa. Tubus stamineus 0·42 cm. long. Antheræ lineares, 0·1 cm. long. Ovarium 0·1 cm. long., stylo angulato appresse sericeo-pubescente 0·2 cm. long. coronatum. Capsulæ non suppetebant.

Mihi videtur ad *Guaream paraensem*, C.DC., accedere, cujus folia admodum similia, ob alabastra ejus vero angusta, elongata, longipedicellata facili obtutu nostra a stirpe dignoscenda. [Amazonia.]

Guarea rubricalyx (sp. nov.). Fruticosa, foliis longiuscule petiolatis, 2–4-jugis, foliolis oppositis, petiolulatis, oblongis vel oblongo-oblanceolatis, breviter et obtuse cuspidatis, basi acutatis, supra glaberrimis, subtus, costâ mediâ appresse pubescente exempta, glabris; petiolulis una cum rhachi primo appresse tomentosis, cito pubescentibus puberulisve; paniculis elongatis, folia subæquantibus, inferne breviter ramosis, superne simplicibus, pluri- et densifloris; alabastris late oblongis; floribus tetrameris; calycis cupuliformis extus puberuli ore inæqualiter 4-dentato; petalis breviter sericeo-puberulis, in sicco rubescentibus; tubo stamineo urceolari, ore obsolete undulato; ovario depresse subgloboso, gynophoro æquilongo, sericeo-puberulo.

Hab. Reperi in ripâ fl. Paraguay, prope Tres Barras, mens. Oct. florentem. (N. 513.)

Ramuli teretes, usque 0·6 cm. diam., primo ochraceo-tomentosi, cito puberuli, cortice tenuissimo cinerascente obducti. Foliorum rhachis 14·0–16·0 cm. long., superne canaliculata. Foliola superiora majora 14·0–16·0 cm. long., inferiora 5·0–10·0 cm. long., illa 4·0–5·0 cm. lat., hæc sæpe usque ad 2·0 vel 3·0 cm. attenuata, coriaceo-membranacea, opaca; costa media supra impressa, subtus prominens; costæ secundariæ utrovis latere circa 10, aperte arcuatæ, demum margini parallelæ, una cum venulis arcte reticulatis subtus eminentiores. Petioluli incrassati, rugati, anguste canaliculati, 0·3 cm. long. Petioli 4·0–10·0 cm. long., late canaliculati Paniculæ usque 22·0 cm. long., pleræque vero circa 14·0 cm. (occurrunt nonnullæ modo 11·0 cm. long.), pubescentes, ramulos patulos, usque 1·5 cm. long., densifloros inferne ferentes, mediâ parte cymulas abbreviatas circa 0·3 cm. long. sustinentes. Flores albi; calyces rubri. Pedicelli sub floribus 0·1 cm. long. Alabastrum aperiens 0·45 cm. long., vix 0·3 cm. lat. Calyx vix 0·15 cm. long. Petala oblonga obtusa, 0·5 cm. long. Tubus stamineus 0·4 cm. long., basi 0·32 cm. lat. Antheræ oblongæ 0·08 cm. long. Ovarium paullo ultra 0.1 cm. long., 0·15 cm. lat. Stylus 0·16 cm. long., minute puberulus. Stigma brevissime exsertum. Capsula ignota.

Cum *G. spiciflorâ*, A. Juss., componenda, distinctissima vero ob foliola opposita (nec alternantia), flores minores, alabastra abbreviata, etc. [Bras. Or.]

CHAILLETIACEÆ.

Tapura amazonica, Poepp. & Endl. Nov. Gen. et Sp. iii. p. 41, var. ciliata, Baill.

Hab. Fructificat ad Santa Cruz mens. Nov. (N. 411.) [Bras. Or., Amazonia, Guiana.]

OLACINEÆ.

Heisteria rubricalyx (sp. nov.). Fruticosa, glabra, caule erecto, ramoso, tereti, internodiis 1·0–6·0 cm. long. (plerisque vero 1·5–3·0 cm.); foliis petiolatis, elongatis, lineari lanceolatis vel lanceolatis, obtusis, sæpe plus minus cuspidatis, basi eximie coarctatis, margine leviter undulatis et saltem in sicco recurvis, coriaceis; pedicellis quam petiolus brevioribus ac tenuioribus; alabastro puberulo, leviter pentagono; floribus 10-andris; calycis lobis deltoideo-lanceolatis, acutiusculis; calycis fructiferi distincte 5-lobati radio drupæ longitudinem superante, ejus lobis reflexis.

Hab. In fruticetis juxta Santa Cruz mens. Sept. flores et fructus gerit. (N. 292.)

Frutex altus (veram altitudinem haud observavi), ramosus, copiose foliatus. Caulis spec. meorum ad 3·5 cm. crass., cortice pallide bruneo vix rimoso obtectus. Foliorum lamina ad 19·0 cm. long. (plerumque vero 10·0–15·0 cm.), medio 2·0–5·3 cm. lat., imâ basi 0·2–0·3 cm. lat., nervus medius supra impressus, subtus prominens; costæ secundariæ utrovis latere circa 12, primo rectæ vel fere rectæ, dein furcatæ et sæpe dichotomæ, supra sæpe latere altero eminentes, altero inconspicuæ vel lateribus ambobus inconspicuæ, subtus magis prominulæ; petiolus 1·0–1·7 cm. long., 0·15–0·2 cm. crass., alte caniculatus, et saltem in sicco leviter tortus. Pedunculi sub fructu 0·7–1·0 cm. long., 0·075 cm. crass., sub flore circa 0·1 cm. long., erecti. Inflorescentiæ basis tumida, plerumque 0·3–0·4 cm. diam. (raro in toto ambitu caulis insidens). Calycis lobi circa 0·05 cm. long. Alabastra vix 0·2 cm. long., 0·1 cm. diam., oblongo-ovoidea. Calycis fructiferi rubri 1·8 cm. diam. lobi inæquales, late ovato-rotundati, obtusi, 0·35–0·4 cm. long., 0·5–0·7 cm. lat. Drupa 1·0 cm. long., 0·6 cm. diam., oblongo-ovoidea, apice brevissime apiculata; sarcocarpio tenui, extus læte viridi, endocarpio fragili.

Juxta *H. laxifloram*, Engl., interponenda, cujus folia, calyces, et drupæ plane dispares. *H. salicifoliæ*, Engl., folia membranacea et drupæ ovato-globosæ modo 0·8 cm. long. [Bras. Or., Amazonia.]

Ximenia americana, Linn. Sp. Pl. ed. I. p. 1193.

Hab. Reperi ad Santa Cruz mens. Nov. florentem. (N. 458.)

Ximenia americana, Linn., forma inermis.

Hab. Matto Grosso (*Leeson*, in Herb. Brit. Mus.). [Bras. Or., Amazonia, Guiana, Ind. Occ., Ind. Or. et Arch.]

CELASTRINEÆ.

Hippocratea ovata, Lam. Illustr. i. p. 100. Forma foliis crenatis vel plus minus crenulatis, usque ad 14·0 cm. long. et 5·5 cm. lat., cymis laxifloris, floribus 0·5–0·6 cm. diam., verisimiliter ad var. *parvifloram*, Peyr., referenda.

Hab. Viget juxta Corumbá et mens. Dec. floret. (N. 1016.) [Amer. Trop.]

Hippocratea (sp. indet.); ramulis patentissimis, foliis oblongis lanceolatisve, nunc oblongo-ovatis, obtusis vel obtusissimis, basi obtusis, crenatis, usque ad 15·0 cm. long.

et 5·5 cm. lat. (sæpe 12·0×4·0 cm., vel 8·0×4·0 cm.), firme coriaceis; costis secundariis circa 6 aperte arcuatis, demum margini undulatim parallelis; petiolis crassiusculis, late canaliculatis, 0·8–1·0 cm. long.; carpidiis lanceolato-obovatis, apice truncato-emarginatis vel cuspidulatis, 4·5 cm. long., juxta basin 1·0 cm., superne 2·0 cm. lat., seminibus in quoque carpidio 4 (an semper?) biseriatis; funiculo basi leviter incrassato, late alato; ala 1·3–1·5 cm. lat. et 2·5–2·8 cm. long., ovato-oblongâ, basi rotundatâ, striâ longitudinali medio percursâ, margine rhaphigero incrassato; nucleo 1·5–1·7 cm. long., 0·5–0·8 cm. lat., oblongo.

Hab. Verisimiliter Santa Cruz, sed, schedulâ prætermissâ, non sine dubio habitationem dico. (N. 527.)

The arrangement of the species of this genus depends primarily upon floral characters, and, inasmuch as I have no flowers, the position of this plant cannot be satisfactorily determined.

SALACIA (§PERITASSA) SIPUTA (sp. nov.). Ramosa, ramulis teretibus, ad nodos parum tumidis, fusco-cinereis, glabris; foliis longipetiolatis, oblongo-ovatis, obtusis, plerisque breviter cuspidatis, margine repando-undulatis, basi subrotundatis vel leviter coarctatis, nonnunquam aliquanto obliquis, coriaceo-chartaceis, glabris; cymis patulis, petiolos $1\frac{1}{2}$–4-plo excedentibus; bracteis minutis, quam pedicelli graciles sub flore leviter ampliati brevioribus; floribus vix 0·5 cm. diam.; petalis oblongo-spathulatis, obtusis, margine eroso-ciliolatis; antherarum connectivo loculos manifeste excedente; disco cyathiformi ovarium subæquante plano, ovarii loculis 2-ovulatis; stylo levi quam ovarium multo breviore, stigmate obscurissime trilobo, fructu ovoideo.

Hab. Ad ripas fl. Paraguay et dos Bugres prope Santa Cruz (Barra dos Bugres), menss. Jul.–Oct. florens, et Sept.–Oct. fructum præbens. "*Siputá*" sive "*Cyputá*" incolarum. (N. 432.)

Arbor circa 12 (?) met. alt., rami sæpe supra fluvium impendentes. Folia 9·0–14·0 cm. long., medio 4·0–5·5 cm. lat.; costæ secundariæ utrinque 6–8, angulis latis insertæ, aperte arcuatæ, marginem versus dichotomæ et anastomosantes; petioli 1·0–1·5 cm. long., in sicco longitudinaliter rugati. Cymæ usque ad circa 5·0 cm. diam. Bracteæ ovatæ, acuminatæ, 0·1 cm. long., glabræ. Pedicelli plerique 0·3–0·5 cm. long. Flores luteo-virescentes. Calycis lobi rotundati, vix 0·15 cm. long. Petala 0·3 cm. long., 0·15 cm. lat. Fructus maturus flavus, sapidus, 3·0–3·5 cm. diam. Semina 2–4 in pulpâ gratissimâ inclusa.

Certe ad *S. dulcem*, Benth., spectat, ob folia vero firmiora, longius petiolata, basi haud cuneata, cymas laxiores, bracteas minutas, flores majores, discum haud plicatum, etc., speciem propriam esse arbitror.

Of the fruit of this tree, which is greatly esteemed at Santa Cruz, the edible portion consists of a small quantity of luscious substance closely investing the 2–4 large seeds. I was fortunate in finding flowers, as, for some time, fruits only were to be seen, and I had been told that it was useless to expect flowers in September. However, one day in October I came upon a tree bearing both flowers and fruit, greatly to the surprise of an intelligent Santa-Cruzan who, with others, had declared the flowering season to have passed. [Amazonia.]

RHAMNACEÆ.

ZIZYPHUS OBLONGIFOLIUS (sp. nov.). Abundanter ramosa, ramis teretibus, plus minus sinuatis, sat crassis, crebre lenticelliferis, puberulis, mox glabris, spinis mediocribus rectis; foliis petiolatis, oblongis vel oblongo-lanceolatis, obtusis, basi coarctatis, apice calvis vel mucronulatis, impariter serratis vel serrulatis, nonnunquam crenulatis vel modo undulatis, basi, præsertim inter nervos, breviter plus minus arcte pilosis, juvenilibus puberulis; cymis pubescentibus, quam folia brevioribus, plurifloris, axillaribus vel terminalibus; calycis pubescentis segmentis ovatis obtusis, petalis reflexis; ovario biloculari, stylo 2-fido.

Hab. Reperi ad viam inter Corumbá et Ladario, ubi mens. Jan. flores et fructus præbet. (N. 1029.)

Frutex circa 2 met. alt. Ramuli vix ad 0·5 cm. crass., grisei, patuli. Spinæ pleræque 0·5–1·0 cm. long., basi 0·1–0·2 cm. crass., teretes, acutatæ. Foliorum lamina 3·5–6·0 cm. long., 1·0–2·5 cm. lat., trinervia, in sicco utrinque virentes, subtus vero paullo pallidior; petioli 0·4–0·6 cm. long., 0·05–vix 0·1 cm. crass., canaliculati, plani, pubescentes, in sicco pallide brunei. Cymæ pubescentes, pleræque 0·5–1·0 cm. long., congestæ, plerumque circa 0·8–1·0 cm. diam. Pedicelli 0·3 cm. long., sub fructu incrassati (vix 0·2 cm. crass.) et paullo elongati. Flores lutescenti-virides, 0·4 cm. diam. Calycis segmenta vix 0·2 cm. long., 0·17 cm. lat., facie superiori manifeste carinata. Petala spathulata, calycis lobos haud excedentia. Stamina calyce breviora (0·13 cm. long.). Discus margine undulatus. Ovarium ovoideum, pubescens, stylo crasso brevi coronatum. Drupa immatura ovoidea, 1·3 cm. long., 1·0 cm. lat., viridis.

Species distinctissima, cum nullâ Brasiliensi hucusque cognitâ comparanda; proxime accedit ad *Z. Mistol*, Griseb., plantam Argentinam, cujus folia diversa, spinæ majores, etc.

Extremely close to this, if not conspecific with it, is a plant of Balansa's (no. 2436), collected at Concepcion, in Northern Paraguay, and described as a shrub 2–3 metres high, with fleshy brown fruit; but, seeing that Balansa's specimen is without flowers, the question as to specific identity cannot be answered. There is also in the Herbarium at Kew a small specimen, gathered by Tweedie at Buenos Aires, which, on superficial examination, closely resembles the Matto Grosso plant, but of which I can find no description. [Argentina.]

RHAMNIDIUM ELÆOCARPUM, Reiss in Mart. Fl. Bras. xii. pars i. p. 94 (ex icon. et descript.).

Hab. Crescit ad Santa Cruz, et in ripâ fl. Paraguay in viciniâ. (Nn. 536, 631.) [Bras. Or.?]

AMPELIDÆ.

VITIS EROSA, Baker in Mart. Fl. Bras. xiv. pars ii. p. 210.

Hab. In ripâ fl. Paraguay inter Santa Cruz et Tres Barras frequens. (N. 497.) [Amer. Trop.]

VITIS (sp. indet.). Specimen mancum, caule sarmentoso, cirrhifero, suberoso, arcte cervino-tomentoso, cirrho elongato tomentello, apice dichotome fisso, 12·0 cm. long.; foliis

ternatim compositis, brevipetiolatis; foliolis ovatis, obtusiusculis, basi obliquis et late rotundatis, margine impariter serrulato-dentatis vel serrulatis, chartaceis, supra, nervis tomentellis exclusis, appresse puberulis, subtus cervino-tomentosis, 5·0–8·5 cm. long., 3·5–5·0 cm. lat.; costis secundariis 6–8 erecto-ascendentibus, leviter arcuatis paribus duobus infimis venuligeris; cymis oppositifoliis, longipedunculatis, pedunculo folia saltem $\frac{1}{2}$-plo excedente; inflorescentiæ ramulis una cum pedunculo cervino-tomentosis, basi glanduliferis; pedicellis tomentosis, plerisque alabastra duplo excedentibus; floribus 4-meris, calycis lobis deltoideis obtusis, petalis lanceolato-oblongis acutiusculis 0·2 cm. long.; staminibus petala semiæquantibus; ovario disco admodum incrassato immerso; baccis ignotis.

Hab. Crescit forsitan ad Corumbá vel ad Santa Cruz, sed, ob schedulam prætermissam, habitationem indicare nequeo.

Probably a new species near *Vitis albida*, Baker, which I do not feel justified in describing, the specimen being so poor and without fruit.

SAPINDACEÆ.

SERJANIA OBTUSIDENTATA, Radlk. Monog. Serj. p. 233.

Hab. Floret ad Cuyabá mens. Aug. (N. 31.) [Bras. Or.]

SERJANIA HEBECARPA, Benth. in Hook. Lond. Journ. Bot. iii. p. 192.

Hab. Schedulâ prætermissâ, planta incertæ habitationis, forsan ad Santa Cruz lecta. [Bras. Or.]

SERJANIA PERULACEA, Radlk. Monog. Serj. p. 227.

Hab. Crescit in angustiis ad Serra da Chapada, necnon ad Jangada; menss. Aug. et Sept. floret et fructificat. (Nn. 75, 267.)

The Jangada specimen has samaras agreeing well with the description of Radlkofer; those from the Serrada Chapada are usually larger, and may almost attain a length of three centimetres, with a width at the loculi of one centimetre. Some of the samaras, however, are typical in respect of size. [Bras. Or., Bolivia, Paraguaria, Argentina?]

PAULLINIA ELEGANS, Cambess. in A. St.-Hil. Fl. Bras. Merid. i. p. 370.

Hab. Ad Santa Cruz et in vicinia floret mens. Nov. (Nn. 521, 629.) [Bras. Or., Paraguaria, Argentina.]

PAULLINIA ANGUSTA, N. E. Br. [in Trans. Bot. Soc. Edinb. xx. (1894) 49].

Hab. Ad Puerto Pacheco fructificabat mens. Feb. (N. 1063.) [Paraguaria.]

ALLOPHYLLUS EDULIS, Radlk. MSS. (*Schmidelia edulis*, A. St.-Hil., Pl. U.S. sub tab. 67.)

Hab. Crescit in sylvulis ad Santa Cruz, ubi floret mens. Sept.; ad Corumbá fructus coccineos ostendit mens Jan. (Nn. 313, 973.) [Bras. Or.]

A third specimen (no. 449), common in the forest between Santa Cruz and Tapirapuan, but found in fruit only, Professor Radlkofer, to whom I sent a sketch, thinks may also belong to this species. The fruits are considerably smaller than those of *A. edulis*, and yellow in colour.

ALLOPHYLLUS SEMIDENTATUS, Radlk. MSS. (*Schmidelia semidentata*, Miq. in Linnæa, xxii. (1849), p. 798.)

Hab. Reperi in ripâ fl. Paraguay inter Santa Cruz et Diamantino mens. Oct. florentem. (N. 616.) [Bras. Or.]

Professor Radlkofer was good enough to determine my specimens of this puzzling genus.

THINOUIA SEPIUM (sp. nov.). Scandens, ramulis gracilibus, teretibus, puberulis, mox glabris; foliis longipetiolatis, ternatis; foliolis petiolulatis, ovatis, obtusis, mucronatis, basi late truncato-cordatis, margine crenato-lobulatis, tenuiter membranaceis, cito utrinque glabris vel fere glabris; cymulis longiuscule pedunculatis, solitariis vel racemosis, plurifloris, globosis, nunc cirrho unico, nunc cirrhis binis onustis, nunc ecirrhosis; sepalis oblongis, ciliolatis; petalis pugioniformibus, sepala excedentibus; staminibus 6–8, exsertis; disco hypogyno integro; carpellorum alis erectis ad columellam centralem affixis; fructus immaturi loculo ovoideo.

Hab. Crescit ad Corumbá, ubi mens. Jan. floret. (Nn. 943, 1076.)

Ramuli 0·2–0·3 cm. diam., in sicco pallidi, crebre striatuli, lenticillis parvis elevatis muniti. Petioli patuli, graciles, 3·0–5·0 cm. long. (superiores vero breviores), obsolete puberuli. Foliola in sicco viridia, pleraque 4·0–6·0 cm. long., et 3·0–6·0 cm. lat., fol. terminale reverâ quam lateralia longius et eximie latius; costæ secundariæ utrinque 4–5, ascendentes, primo rectæ, dein leviter arcuatæ, sæpe in dentem brevem desinentes; fol. lateralium petioluli patuli, circa 0·5 cm. long., fol. terminalis petiolulus 1·0–1·5 cm. long., superne anguste alatus. Pedunculi cymarum solitariarum sæpe 4·0 vel 5·0 cm. attingentes, cymularum racemosarum ±2·0 cm. long., minute puberuli, graciles. Cymulæ 1·0 cm. diam., si racemosim dispositæ pedunculis (neque ultra 0·8 cm. long.) insidentes. Flores albi. Pedicelli puberuli, usque ad 0·2 cm. long. Sepala 0·08 cm. long. Petala 0·1 cm. long., longiuscule pilosa. Filamenta inferne pilosa, superne sensim attenuata et glabra, 0·17 cm. long.; antheræ ovato-oblongæ, pilosæ. Fructus nondum maturus stipite 0·6 cm. long. insidens, oblyratus, apice retusus, minute puberulus, usque ad 1·4 cm. long., sursum 0·8 cm. lat., ejus loculus 0·6 cm. long. 0·5 cm. lat.

Non dubito quin affinis sit *T. paraguensi* (*Thouiniæ paraguensi*, Britton, in Ann. N. York Acad. Sc. vii. (1893) p. 75; Balansa 2486, 2486 *a*, et 2488 in Herb. Kew.), abs quâ reverâ primo obtutu cognoscenda, inter alia, foliolis disparibus, membranaceis, nec subtus molliter pubescentibus.

While agreeing with Radlkofer that the nature of its inflorescence and fruit justifies the separation of *Thinouia* from *Thouinia*, I cannot but regret that the former name should be used in preference to Karsten's *Carpidiopteryx*, published at the same time as *Thinouia*, and free from the objection of being a mere anagram, and, moreover, a puzzling one. As, however, Radlkofer adheres to *Thinouia* in the recently published first part of the Sapindaceæ of Von Martius's 'Flora Brasiliensis,' there seems to be no option but to follow his lead. [Paraguaria.]

MATAYBA GUIANENSIS, Aubl. Pl. Guian. i. p. 331.

Hab. Ad Santa Cruz flores albos præbet mens. Dec. (N. 765.) [Bras. Or., Guiana, Amazonia.]

ANACARDIACEÆ.

[ANACARDIUM OCCIDENTALE, Linn. Sp. Pl. ed. I. p. 383, in provinciâ sæpe colitur.

Ad Serra da Chapada et alibi sæpe vidi hujus generis speciem nanam, floriferam, rarius fructificantem, verisimiliter ad *A. pumilum*, A. St.-Hil., relegandam.

By some oversight I omitted to dry specimens of this curious little Cashew.]

SPONDIAS LUTEA, Linn. Sp. Pl. ed. II. p. 613.

Hab. Ad Santa Cruz fructus immaturos præbet mens. Dec. *Cajá* incolarum. (N. 802.)

The people at Santa Cruz mash the ripe fruit and make a pleasant drink of the juice with sugar, and according to Miers (' Woods of Brazil,' MSS. in Herb. Brit. Mus.) the same course is pursued in Eastern Brazil. Miers notes that the fruit is intensely sour. [Amer. Trop., Ind. Occ., Afr. Occ. Trop., Ind. Arch.]

TAPIRIRA GUIANENSIS, Aubl. Pl. Guian. i. p. 470.

Hab. Crescit ad Santa Cruz, ubi menss. Oct.–Dec. floret. (Nn. 466, 468, 764.) [Amer. Austr. Trop.]

CONNARACEÆ.

ROUREA DONIANA, Baker in Mart. Fl. Bras. xiv. pars ii. p. 179 (ex descript.).

Hab. Ad Santa Cruz mens. Sept. floret et fructificat. (N. 291.)

Flores albi. Capsulæ oblongo-cylindraceæ, breviter apiculatæ, vivæ coccineæ, 1·0–1·25 cm. long., 0·4 cm. diam. [Amazonia.]

CONNARUS FULVUS, Planch. in Linnæa, xxiii. p. 434.

Hab. Ad Serra da Chapada floret mens. Aug. (N. 150.) [Bras. Or., Goyaz.]

LEGUMINOSÆ.

CROTALARIA ANAGYROIDES, H. B. K. Nov. Gen. et Sp. vi. p. 404.

Hab. Reperi ad Coimbrá mens. Feb. florentem. (N. 1065.) [Amer. Austr. Trop.]

TEPHROSIA BREVIPES, Benth. in Ann. Nat. Hist. iii. p. 432.

Hab. Floret ad Coimbrá mens. Feb. (N. 1075.)

The flower varies in colour, Schomburgk describing it as blue, and Weddell as yellow; at Coimbrá it was dark purple. [Bras. Or., Peruvia, Guiana, Trinidad.]

TEPHROSIA ADUNCA, Benth. in Ann. Nat. Hist. iii. p. 432.

Hab. Schedulâ prætermissâ, locus natalis incertus. [Bras. Or., Goyaz, Guiana, Paraguaria, Uruguaria.]

SESBANIA MARGINATA, Benth. in Mart. Fl. Bras. xv. pars i. p. 43.

Hab. Crescit ad Corumbá, ubi flores præbet mens. Jan. (N. 1040.) [Uruguaria, Paraguaria.]

Sesbania ?, sp. nov. Herbacea, foliis elongatis petiolatis, paripinnatis, foliolis 8–9-jugis brevissime petiolulatis, oblongo-oblanceolatis, obtusissimis, basi obtusis, 2·0–3·5 cm. long., 0·8–1·2 cm. lat., una cum rhachi piloso-pubescentibus; racemis quam folia brevioribus, paucifloris, pubescentibus; floribus albis; calycis pubescentis lobis triangularibus, longe acuminatis; vexillo late obovato, apice emarginato, alas oblongas et carinam obtusam paullo superante; fructu ignoto.

Hab. Ad Coimbrá floret mens. Feb. (N. 1068.)

Æschynomene sensitiva, Sw. Fl. Ind. Occ. iii. p. 1256.

Hab. In paludosis inter Corumbá et Dorados floret mens. Jan. (N. 1005.) [Amer. Trop., Ind. Occ., Afr. Trop., Madagascaria.]

Æschynomene hispida, Willd. Sp. Pl. iii. p. 1163.

Hab. Legi prope Corumbá mens. Jan. florentem. (N. 914.) [Amer. Trop. et Subtrop.]

Æschynomene oroboides, Benth. in Mart. Fl. Bras. xv. pars i. p. 64.

Hab. Ad Serra da Chapada floret mens. Aug. (N. 194.) [Bras. Or., Goyaz.]

Rhizoma crassum, leviter nodulosum, 0·7 cm. diam., in sicco fusco-bruneum.

Discolobium pulchellum, Benth. in Mart. Fl. Bras. xv. pars i. p. 73, var. major, S. Moore.

A typo divergens foliis longioribus usque ad 10-jugis, foliolis longiuscule petiolulatis (petiolulis fere 0·3 cm. long.), ad 4·0 cm. long., medio 1·1 cm. lat., pedunculis 1·0 cm. long., floribus 2·0 cm. long.

Hab. Schedulâ prætermissâ, habitationem indicare nequeo: forsitan Coimbrá, nisi Puerto Pachieco. [Bras. Or., Paraguaria.]

Stylosanthes viscosa, Sw. Fl. Ind. Occ. iii. p. 1285.

Hab. Crescit ad Cuyabá mens. Aug. florens. (N. 25.) [Amer. Trop., Ind. Occ.]

Zornia diphylla, Pers. Syn. ii. p. 318, var. gracilis, Benth.

Hab. Ad Santa Anna da Chapada legi mens. Aug. (N. 132.) [In tropicis et subtropicis late disseminata.]

Desmodium incanum, DC. Prod. ii. p. 332.

Hab. Crescit ad Santa Cruz. (Nn. 421, 453.) [Amer. Trop., Ind. Occ.]

Desmodium axillare, DC. Prod. ii. p. 333.

Hab. Crescit in sylvâ primævâ prope Santa Cruz. (N. 343.) [Amer. Trop., Ind. Occ.]

Desmodium platycarpum, Benth. in Mart. Fl. Bras. xv. pars i. p. 100.

Hab. Legi inter Cuyabá et Serra da Chapada mens. Aug. florentem. (Nn. 20, 64.)

Rhizoma maxime incrassatum, nodulosum, interdum usque 2·0 cm. diam. dilatatum, in sicco fusco-purpureum. [Bras. Or., Goyaz.]

CENTROSEMA VEXILLATUM, Benth. in Ann. Nat. Hist. iii. (1839) p. 435.

Hab. Reperi in loco paludoso juxta Corumbá mens. Jan. florentem. (N. 968.) [Amazonia, Guiana.]

TERAMNUS VOLUBILIS, Sw. Fl. Ind. Occ. iii. p. 1241.

Hab. Crescit prope Corumbá necnon ad Coimbrá. (Nn. 1010, 1073.) [Amazonia, Nov. Granat., Amer. Centr., Ind. Occ.]

GALACTIA GLAUCESCENS, H. B. K. Nov. Gen. et Sp. vi. p. 431.

Hab. Flores purpureos præbet ad Santa Cruz mens. Oct. (N. 651.) [Bras. Or., Goyaz, Columbia.]

GALACTIA RUGOSA, S. Moore. (*Collæa rugosa*, Benth. in Ann. Wien. Mus. ii. (1838) p. 128.)

Hab. Ad Jangada floret mens. Sept. (N. 268.) [Goyaz.]

GALACTIA (§ EUGALACTIA) WHITEHORNII, S. Moore. Volubilis, glabriuscula, foliolis 3 (f. terminali paullo majore et petiolato) lanceolatis, apice mucronatis, basi angustatis, membranaceo-coriaceis, puberulis, paginâ superiore pallide nitentibus, inferiore eximie nervoso-reticulatis; pedunculis axillaribus, quam folia longioribus, erectis; pedicellis brevibus, sericeo-tomentosis; calycis pubescentis laciniis elongatis; corollâ calycem duplo excedente; stamine vexillari omnino libero; ovario sericeo-tomentoso.

Hab. In angustiis ad Serra da Chapada alt. circ. 300 met. floret mens. Aug. (N. 200.)

Caulis gracilis, teres, in sicco ravus. Stipulæ subulatæ, 0·2 cm. long.; foliola usque ad 8·7 cm. long. et 3·1 cm. lat.; costa media subtus eminens; costæ secundariæ utrovis latere 9–10, 2 infimæ approximatæ, oblique insertæ, levissime arcuatæ, deinde margini undulatim parallelæ, subtus prominulæ; venulæ laxe reticulatæ, subtus eminentes, pulvinuli pubescentes, fusco-rufi; folioli terminalis petiolulus ad 1·5 cm. long.; foliola lat. omnino sessilia. Pedunculi ad 15·0 cm. long., teretes, puberuli, demum fere glabri; pedicelli albide pubescentes, mox puberuli, ad 0·5 cm. long. Bracteæ firmæ, ovatæ, acutiusculæ, striatæ, obtuse carinatæ, puberulæ, 0·2 cm. long. Flores purpurei. Calycis tubus 0·7 cm. long., longitudinaliter nervosus; laciniæ longiores 0·8 cm. long., laterales 0·6 cm. long.; lacinia antica anguste lineari-oblonga acuta, laciniæ laterales quam lac. anticam latius lineares et fere glabræ. Vexillum oblongo-spathulatum, basin versus margine recurvum, 3·0 cm. long.; alæ lineares, breviter 1-auriculatæ, 2·7 cm. long.; carina recta, alas paullo excedens. Ovarium sessile.

Species nulli affinis; flores præbet eos *G. rugosæ* in mentem revocantes, sed, præterquam filamentum vexillare omnino liberum, foliis prorsus diversis gaudet.

DIOCLEA LASIOCARPA, Mart. ex Benth. in Ann. Wien. Mus. ii. p. 133.

Hab. Crescit ad ripas fl. Cuyabá prope Melgaço, mens. Aug. florens. (N. 7.) [Amer. Austr. Trop.]

PHASEOLUS APPENDICULATUS, Benth. in Ann. Wien. Mus. ii. p. 137.
Hab. Ad Serra da Chapada floret mens. Aug. (N. 203.) [Bras. Or.]

PHASEOLUS LASIOCARPUS, Mart. ex Benth. in Ann. Wien. Mus. ii. p. 140.
Hab. Crescit in paludibus prope Corumbá, mens. Jan. florens. (N. 1001.) [Bras. Or. (?), Amazonia, Guiana.]

RHYNCHOSIA PHASEOLOIDES, DC. Prod. ii. p. 385.
Hab. Crescit ad Serra da Chapada prope pagum Santa Anna da Chapada. (N. 126.) Caulis e rhizomate admodum incrassato, leviter tortuoso, usque 1·5 cm. diam. assurgens. [Amer. Trop.]

ERIOSEMA SIMPLICIFOLIUM, Walp. Rep. ii. p. 902.
Hab. Ad Santa Cruz floret mens. Nov. (N. 593.) [Bras. Or., Amazonia, Guiana, Columbia.]

PLATYPODIUM ELEGANS, Vog. in Linnæa, xi. p. 422.
Hab. Crescit ad ripas fl. Paraguay prope Tres Barras. (N. 492.) [Bras. Or., Goyaz, Bolivia.]

PTEROCARPUS ROHRII, Vahl, Symb. ii. p. 79.
Hab. Ad Corumbá reperi mens. Jan. florentem. (N. 942.) [Goyaz, Amazonia, Guiana, Venezuela.]

PLATYMISCIUM FLORIBUNDUM, Vog. in Linnæa, xi. p. 199.
Hab. Ad Jangada floret mens. Sept. (N. 271.)
Arbuscula circa 4-metralis, trunco gracili, crebre ramoso. Folia pallide virentia. Flores aurantiaci. [Bras. Or.]

GEOFFRÆA, sp. indet., ex affinitate *G. superbæ*, H. B. K.
Hab. Crescit in ripâ fl. Paraguay juxta montem Pão d'Assucar dictum, mens. Feb. fructus vix maturos ferens. (N. 1043.) [Bras. Or., Peruvia, Venezuela.]

BOWDICHIA VIRGILIOIDES, H. B. K. Nov. Gen. et Sp. vi. p. 376, var. FERRUGINEA, Bth.
Hab. Circum Cuyabá sat frequens, mens. Aug. florens. (N. 26.) [Bras. Or., Goyaz, Amazonia, Guiana, Venezuela.]

CÆSALPINIA TAUBERTIANA (sp. nov.). Arborea, inermis; foliis brevipetiolatis, nunc impari- nunc paripinnatis, 8–10-jugis; foliolis parvis 20–28, raro usque ad 16 reductis, sæpius alternis, ovato-oblongis, basi maxime obliquis, coriaceis, utrinque reticulato-venosis; floribus parvis paniculatis, paniculis quam folia brevioribus floribundis, calycis lobis imbricatis, staminibus quam petala paullulum brevioribus.
Hab. Crescit ad Corumbá, ubi mens. Jan. floret. (N. 1037.)

Arbuscula. Ramuli subteretes, mox glabri, cortice brunescente vel erubescente, pallide nitido, lenticellis parvis albidis abunde obsito tecti. Foliorum rhachis cum petiolo 10·0–13·0 cm. long. (foliorum summorum vero usque ad 8·0 cm. miniata), basi eximie pulvinata, arcte tomentosa; petioluli communes 4·0–6·0 cm. long., pulvinulati, pubescentes. Foliola 0·7–1·0 cm. long., summum usque ad 0·5 cm. lat., apice obtusissima, supra pallide nitidula, subtus aliquatenus decoloria, margine ciliata, ceteroquin (interdum obsolete) piloso-puberula. Stipulæ caducissimæ. Paniculæ 8·0–9·0 cm. long., anguste thyrsoideæ, ferrugineo-tomentosæ; ramuli erecti vel ascendentes, tomentosi, glandulis parvis obsiti. Pedunculi erecti, rigidi, ipso sub flore articulati, ferrugineo-tomentosi, nunc ultra 1·0 cm. long., nunc usque ad 0·5 cm. abbreviati. Bracteæ lanceolatæ, 0·15 cm. long., longe ante floritionem evanidæ. Calycis ferrugineo-tomentosi tubus amplus, lobis brevior, lobus infimus elongatus, ovato-oblongus, obtusissimus, 0·7 cm. long., 0·45 cm. lat., lobi reliqui ovati, acuti, 0·55 cm. long. Petala lutea, 1·2–1·4 cm. long., obovata, unguibus latis tomentoso-villosis insidentia, glandulis paucis immersis instructa. Filamenta crassiuscula, complanata, 1·0–1·15 cm. long., sursum attenuata, basi villosa, tomentosa, glandulis stipitatis sparsis prorsus plus minus munita; antheræ oblongæ, 0·2 cm. long. Ovarium lineari-oblongum, tomentellum, 0·3 cm. long., in stylum pubescentem, apice glabrum, 1·0 cm. long. desinens. Stigma parvum, clavellatum. Legumen haud obvium.

Species juxta *Cæsalpiniam microphyllam*, Benth., interponenda, cujus ramuli glandulosi, folia et foliola minora (hæc itaque pauciora), inflorescentia racemosa glanduloso-tomentosa, calyx dispar, etc. *C. peltophoroides*, Benth., inflorescentiâ racemosâ, foliorum rhachi abbreviatâ, foliolis membranaceis evenosis gaudet.

Dr. Taubert kindly examined a specimen of this plant for me.

Cæsalpinia Gilliesii, Wall. ex Hook. Bot. Misc. i. p. 129.

Hab. Matto Grosso (*Leeson*, in Herb. Mus. Brit.). [Argentina.]

[Cæsalpinia pulcherrima, Sw. Obs. Bot. p. 166.

Hab. Ad Corumbá colitur.

I did not press specimens of this common plant.]

Cassia occidentalis, Linn. Sp. Pl. ed. I. p. 377.

Hab. Frequens ad Corumbá, Coimbrá, et alibi in provinciâ. (N. 967 *a.*) [In tropicis late disseminata.]

Cassia Tora, Linn. Sp. Pl. ed. I. p. 376.

Hab. Reperi ad Corumbá. (N. 968 *a.*) [Frequens in regionibus tropicis.]

Cassia pilifera, Vog. Syn. Gen. Cass. p. 23, var. subglabra, S. Moore; caule fere omnino glabro pilis brevibus sparsissime induto, foliolis oblongis quam ea typi angustioribus, floribus minoribus. An species propria inter *C. piliferam* et *C. Tora*, medium tenens?

Hab. In paludibus ad Carandajinho juxta Corumbá floret mens. Jan. (N. 919.) [Bras. Or., Goyaz, Bolivia, Amer. Centr.]

Cassia velutina, Vog. Syn. Cass. p. 24.
Hab. Matto Grosso (*Leeson*, in Herb. Mus. Brit.). [Bras. Or.]

Cassia dysophylla, Benth. in. Mart. Fl. Bras. xv. pars ii. p. 117.
Hab. Frutex fere orgyalis fructificat ad Cuyabá mens. Aug. (N. 36.) [Goyaz.]

Cassia alata, Linn. Sp. Pl. ed. I. p. 378.
Hab. Crescit in paludosis ad Corumbá, ubi floret mens. Jan. (N. 967.) [In tropicis vulgatissima.]

Cassia aculeata, Pohl, ex Bth. in Mart. Fl. Bras. xv. pars ii. p. 127.
Hab. Viget in paludibus ad Carandajinho mens. Jan. florens. (N. 907.) [Bras. Or., Goyaz.]

Bauhinia obtusata, Vog. in Linnæa, xiii. 1839, p. 305.
Hab. Circum Cuyabá sat frequens, itaque ad Santa Cruz. (N. 21.)
My Santa Cruz specimens were lost, but I feel sure that the plant occurs at that place. [Bras. Or., Goyaz.]

Bauhinia microphylla, Vog. in Linnæa, xiii. 1839, p. 301.
Hab. Juxta montem Pão d'Assucar flores virides præbet mens. Feb. (N. 1082.) [Bras. Or., Cuba.]

Bauhinia heterandra, Benth. in Mart. Fl. Bras. xv. pars ii. p. 196.
Frutex orgyalis; flores virides ad Corumbá mens. Jan. fert. (N. 952). [Bras. Or., Goyaz.]

Bauhinia (§ Pauletia) Vespertilio (sp. nov.). Sparsim debiliterque aculeolata, caule ascendente, subtereti, tomentoso-hirsuto, deinde glabro vel fere glabro et cinereo; stipulis setaceis, hirsutis, quam petiolus brevis dense hirsuto-tomentosus brevioribus; foliis coriaceo-membranaceis, quadrangulari-ovato-cordatis, breviter bilobis, 9–11-nerviis, supra glabris, subnitentibus, eminenter reticulato-venosis, subtus, præcipue secus nervos, crebre hirsutis, margine ciliatis, lobis late triangulari-deltoideis, obtusis vel obtusissimis; alabastris elongatis anguste clavatis, obtusis, apice breviter 5-setosis; petalis lineari-spathulatis, obtusis; antheris omnibus subæquilongis, linearibus; ovario longe stipitato, tomentoso; stylo crasso, stigmate dilatato, legumine stipitato hirsuto-tomentoso.

Hab. Santa Cruz, mens. Nov. florescens. (N. 587.)

Frutex gracilis, ad 2·5 met. alt., sparsim ramosa; aculei 1·0 mm. long., brunei. Folia ad 7·0 cm. long., medio ad 9·0 cm. lat.; lobi ad 2·3 cm. long. Pedicelli solitarii vel gemini, hirsuti, 2·4–4·0 cm. long., demum recurvi. Bracteæ et

bracteolæ setaceæ, 0·5–1·0 cm. long., hirsutæ. Calycis hirsuto-tomentosi tubus longitudinaliter striatus, circa 1·5 cm. long., 0·7 cm. lat.; laciniæ spathulato-lineares, circa 3·0 cm. long. Petala obtusa, margine crispata, glabra, alba. Filamenta imâ basi connata, glabra. Stylus calycis laciniis brevior, glaber. Legumen (haud maturum) 11·0 cm. long., basi angustatum, sub apice attenuatum.

Proxime accedit ad *Bauhiniam mollem*, Walp., discedit vero indumento, foliis diversiformibus, alabastris apice 5-setosis, necnon punctis aliis. [Goyaz.]

BAUHINIA (§ PAULETIA) CORUMBENSIS, (sp. nov.). Aculeata, ramosa, caule subtereti longitudinaliter striatulo, glabrato; stipulis parvis, setiformibus; foliis membranaceis, ovate cordato-rotundatis, breviter bilobis, 9-11-nervis, supra glabris, subtus appresse pubescentibus puberulisve, in sicco fere concoloribus, eximie reticulato-nervosis, lobis rotundatis, obtusissimis; alabastris mediocribus, oblongis, basi angustatis, juxta medium attenuatis, apice obtusis et integris vel brevissime 5-apiculatis; petalis linearibus, obtusis; antheris subæqualibus; ovario longe stipitato, tomentoso; stylo superne incrassato, stigmate dilatato; legumine stipitato, basi angustato, appresse sericeo-tomentello.

Hab. Juxta Corumbá, mens. Jan. florens et fructum gerens. (N. 1039.)

Frutex ramosus; aculei recti vel paullo recurvi, 0·3 cm., ramulorum ultimorum 0·15 cm. long. Foliorum lamina ad 3·5 cm. long., medio ad 5·0 cm. lat. nervo medio calvo vel apiculo debili ad 0·3 cm. long. coronato; lobi ad 1·2 cm. longi.; petiolus ad 2·0 cm. long., demum glaber. Stipulæ ad 0·3 cm. long. Pedicelli ad 1·5 cm. long., tomentelli demum glabri. Bracteæ et bracteolæ setaceæ, 0·25 cm. long. Calycis tomentelli tubus ventricosus, in sicco longitudinaliter striatus, 1·2 cm. long., 0·7 cm. lat.; laciniæ lineares, acutiusculæ, margine crispatæ, circiter 3·0 cm. long. et 0·25 cm. lat. Petala anguste spathulata, ut opinor alba. Filamenta basi connata, puberula. Stylus ovarium subæquans, vix omnino glaber; ovula ad 23. Legumen usque ad 17·5 cm. long., 1·0–1·3 cm. lat., obtusiusculum, ipso sub apice rostratim constrictum.

Accedit ad *B. brevilobam*, Benth., sed ob spinas rectas vel paullo recurvas, formam diversam loborum foliorum minorum, alabastra breviora latiora, necnon petala augustiora, præter alias notas, optime distincta. [Bras. Or.]

BAUHINIA RUBIGINOSA, Bong. in Mém. Acad. Pétersb. sér. VI., iv. (1836), p. 112.

Hab. Ad Santa Cruz floret mens. Sept. (N. 363.)

Forma foliolis discretis. [Bras. Or., Goyaz, Guiana, Amazonia.]

BAUHINIA CUMANENSIS, H. B. K. Nov. Gen. et Sp. vi. p. 321.

Hab. Frequens circum Cuyabá, ubi floret mens. Aug.; ad Santa Cruz mens. Nov. fructificat. (Nn. 32, 592.) [Goyaz, Guiana, Columbia.]

COPAIFERA ELLIPTICA, Mart. Herb. Fl. Bras. 127.

Hab. Ad Cuyabá fructificat mens. Aug. (N. 27), itaque sine loci indicatione Leeson in Brit. Mus. [Matto Grosso.]

PROSOPIS RUSCIFOLIA, Griseb. Pl. Lorentz. p. 82.

Hab. Legi ad Puerto Pacheco et floribus et fructibus orbam. (N. 1053 *a*.) [Paraguaria, Argentina.]

ACACIA FARNESIANA, Willd. Sp. Pl. iv. p. 1083.

Hab. Matto Grosso (*Leeson* in Herb. Brit. Mus.). [Late diffusa.]

MIMOSA VELLOZIANA, Mart. Herb. Fl. Bras. 185. Forma parva, ægre semimetralis, spinis minutis, foliolis angustis. Vix, me judice, species propria.

Hab. Ad Jangada floret mens. Sept. (N. 252.) [Bras. Or., Columbia, Amer. Centr.].

MIMOSA (§ EUMIMOSA PECTINATA) PACHECENSIS (sp. nov.). Suffruticosa, caule pubescente, deinde glabra, aculeis parvis infrastipularibus sæpe ternis, pinnis unijugis, foliolis 18–20-jugis anguste lineari-oblongis, obliquis, obtusis vel breviter apiculatis, margine passim setuloso-serratulis, subtus (in sicco) pallidioribus et pilis strigosis appressis sparsim obtectis, rhachide pubescente; pedunculis axillaribus, capitulis globosis; floribus 4-meris 4-andris; legumine inchoato lineari marginibus setis munito, valvis spinuloso-hispidulis.

Hab. In campis prope Puerto Pacheco, inter Asuncion et Corumbá. (N. 1058.)

Caulis ramosus, cortice fusco. Spinæ rectæ, bilateraliter compressæ, pallide fulvæ, 0·15–0·25 mm. long. Stipulæ firmæ, lineari-subulatæ, acutæ, pubescentes, margine rigide ciliatæ, 0·15–0·2 cm long. Petioli circa 0·8 cm. long., appresse pubescentes; pulvinus minutus; stipellæ subulatæ 0·1 cm. long.; foliola ad 0·5 cm. long. et 0·15–0·2 cm. lat., foliolorum rhachis usque ad 4·0 cm. long. Capitulum 0·8 cm. diam. Corolla 0·2 cm. long., obconica; petala obtusa, apice leviter incrassata. Filamenta vix 0·5 cm. long. Legumen 2·0–2·2 cm. long., 0·3 cm. lat.

M. polycarpæ, Kunth, proxima, sed aculeis parvis sæpe ternis, foliolis minimis paucius-jugis, leguminis setis debilioribus ab eâ clare dignoscenda. [Bras. Or., Goyaz., Bolivia, Peruvia, Columbia.]

MIMOSA HEXANDRA, M. Micheli, Contrib. Fl. Paraguay, p. 91, var. TROPICA, S. Moore. A typo distat spinis parvis, pedicellis gracilibus, ovario omnino glabro nec apice piloso.

Hab. Suffrutex parvus diffusus; ad Puerto Pacheco mens. Feb. floret et fructus immaturos fert. (N. 1078.) [Paraguaria.]

MIMOSA CINEREA, Vell. Fl. Flum. xi. t. 35.

Hab. Floret ad Coimbrá mens. Feb. (N. 1072.) [Bras. Or, Goyaz, Uruguaria.]

CALLIANDRA CHAPADÆ (sp. nov.). Frutex, caule ascendente glabro, cortice bruneo-cinereo; pinnis plerumque 7-jugis (3–8-jugis, rarissime 3-jugis); foliolis multijugis, obliquis, oblongo-linearibus, acutis, nitidis; capitulis a pedunculis axillaribus vel terminalibus crassis tomentosis quam folia brevioribus suffultis; floribus breviter

pedicellatis dense lanato-velutinis, corollâ calycem amplum vix duplo excedente, legumine (immaturo) recto, sublignoso, flavescenti, sericeo-velutino.

Hab. Serra da Chapada, circa 1800 ped. supra mare. Fl. Aug. (N. 160.)

Frutex prolixus ad 6 met. alt. Caulis subteres, longitudinaliter striatus. Stipulæ firmæ, lanceolato-oblongæ, acutæ, glabratæ, usque ad 0·7 cm. long. Petiolus communis manifeste pulvinatus, 0·5–2·0 cm. long.; pinnæ confertæ, ad 6·0 cm. long.; foliola ad 38-juga, subtus albida, foliorum majorum 0·7 cm. longa. Pedunculus 2·0–4·0 cm. long. Capitula plerumque 10–15-flora. Stipulæ lineares, scariosæ, 0·3 cm. long. Pedicelli 0·3 cm. long., crassi. Calyx 0·5 cm. long., medio 0·4 cm. lat.; lobi ovati, obtusi, 0·15 cm. long. Corolla 0·9 cm. long., extus plane sericeo-velutina. Staminum alborum tubus 0·3 cm. long., filamenta 4·5 cm. Legumen immaturum 4·5 cm. long.

Affinis *Calliandræ Tweediei*, Benth., abs quâ pinnis plurijugis, pedunculis necnon pedicellis crassis tomentosis, floribus majoribus dense lanato-velutinis, staminibus albis insigniter abhorret. [Bras. Or.]

Calliandra parviflora, Benth. in Hook. Lond. Journ. Bot. iii. p. 112.

Hab. Ad Santa Cruz floret mens. Nov. (N. 737.) [Bras. Or., Goyaz, Amazonia, Bolivia.]

Pithecolobium stipulare, Benth. in Mart. Fl. Bras. xv. pars ii. p. 450.

Hab. Crescit in sylvâ primævâ inter Santa Cruz et Tapirapuan, mens. Sept. florens. (N. 395.) [Amazonia, Guiana.]

Inga nobilis, Willd. Enum. Hort. Berol. 1047.

Hab. Crescit ad Serra da Chapada, necnon ad ripas fl. Paraguay prope Tres Barras (Nn. 69, 621.) [Goyaz, Amazonia, Guiana, Peruvia, Columbia.]

Inga (§ Pseudinga, Pilosiusculæ) Sanctæ-annæ (sp. nov.). Rufo-pilosula, petiolo alato, apice calvo (vulgo haud setifero), biglanduloso, glandulis crateriformibus sessilibus; foliolis bijugis, mediocribus, ovato-lanceolatis, cuspidatis vel acuminatis, basi angustatis, utrinque (imprimis præter nervum medium paginæ inferioris) rufo-pilosulis, membranaceo-coriaceis; floribus in racemis paucifloris, pedunculis foliolis brevioribus suffultis digestis; pedicellis calycem longitudinaliter striatum obscure pilosiusculum fere subæquantibus; corollâ sericeo-villosâ, quam calyx duplo longiore; staminum tubo paullo exserto.

Hab. Crescit ad ripas fl. Santa Anna, ubi floret mens. Oct. (N. 611.)

Arbor circa 25 (?) met. alt. Caulis obscure angulatus, cortice cinereo lenticellifero obtectus. Foliorum rhachis ad 4·5 cm. long.; alæ 0·6–1·0 cm. lat. jugum proximum 6·0–10·5 cm., jugum remotum 6·5–16·0 cm. long.; foliola subtus pallidiora; costæ secundariæ utrinque 10–14 (adjectis paucis secundi ordinis), oblique ascendentibus, juxta marginem arcuatim et undulatim conjunctis, supra impressis, subtus eminentibus. Pedunculi ad 5·5 cm. long., rufo-pilosuli, leviter sulcati; bracteæ setaceæ vix 0·2 cm. long.; pedicelli 0·4 cm. long., graciles. Flores lutei. Calyx 0·5 cm. long., urceolatus. Corollæ lobi triangulares, acuti, circiter 0·2 cm. long. Filamenta corollâ duplo longiora, lutea. Legumen ignotum.

Nobis videtur proxime accedere ad *I. setiferam*, DC., sed statim diversa adjudicari, præter alia (ex. gratiâ, petiolum vulgo calvum, foliola minora), ob pedicellos calycem pæne subæquantes. [Amazonia, Guiana, Ins. Trinitatis.]

INGA EDULIS, Mart. Herb. Fl. Bras. 113.

Hab. Crescit ad ripas fl. Paraguay juxta Santa Cruz. (N. 508.) [Amazonia, Guiana, Columbia, Amer. Austr.]

ROSACEÆ.

MOQUILEA TURIUVA, Hook. f. in Mart. Fl. Bras. xiv. pars ii. p. 25.

Hab. Ad Santa Cruz floret mens. Nov. (Nn. 564, 586.)

Frutex ramosus, trimetralis, inferne aphyllus. Flores albi. [Amazonia, Guiana, Venezuela.]

HIRTELLA AMERICANA, Aubl. Pl. Guian. i. p. 247.

Hab. Crescit in angustiis ad Serra da Chapada, mens. Aug. florens. (N. 78.) [Amer. Trop., Ind. Occ.]

HIRTELLA COLLINA (sp. nov.). Fruticosa, ramosa, ramulis copiose foliatis, teretibus, hirtulo-pubescentibus dein glabris; foliis subsessibilis, nonnunquam subamplexicaulibus, lanceolatis, acutis vel breviter cuspidato-acuminatis, basi rotundatis, parum attenuatis, firme coriaceis, subtus plerumque puberulis vel omnino glabris, eximie reticulate nervosis; paniculis racemiformibus, elongatis, pendulis, multifloris, plerumque quam folia circa duplo longioribus, hirtulo-pubescentibus; pedicellis hirtulo-pubescentibus, glandulis instructis; bracteis setaceis pedicellos subæquantibus; calycis tubo urceolari limbo æquilongo; petalis calycis lobos subæquantibus; staminibus (an semper ?) 7; stylo, stamina excedente, inferne sericeo.

Hab. Reperi in angustiis ad Serra da Chapada mens. Aug. florentem. (N. 141.)

Ramuli 0·2–0·3 cm. diam., nunc fusci, nunc cinerei, nitidi, verruculis minimis præditi. Folia 7·5–12·0 cm. long., 2·7–4·0 cm. lat., firme coriacea; costæ secundariæ utrovis latere circa 10, dein dichotomæ et arcuatim junctæ, una cum costâ mediâ utrinque, præsertim vero subtus, eminentes; venulæ laxe reticulatæ, utrinque prominulæ; petioli ad 0·3 cm. long., hirtulo-pubescentes; stipulæ setaceæ, hirtulæ, 0·4 cm. long. Paniculi evoluti 14·0–26·0 cm. long., axillares vel terminales, tenues; bracteæ 0·3–0·4 cm. long. Pedicelli patuli, hirtuli, 0·25 cm. long. uni- vel biglandulosi, si biglandulosi glandulâ inferiore plerumque plus minus cassâ, glandulæ usque 0·1 cm. long. Flores circa 0·6 cm. diam. Calycis hirtuli tubus vix 0·35 cm. long., juxta medium 0·2 cm. lat., basi usque 0·1 et sub limbo ad 0·15 cm. contractus; lobi oblongi, obtusi, margine membranacei. Petala, ut opinor alba, oblongo- vel anguste oblongo-obovata, 0·15 cm. lat. Filamenta glaberrima, sursum angustata, paullulum ultra 1·0 cm. attingentia. Ovarium anguste ovoideum, longe sericeum, 0·1 cm. long. Stylus 1·5 cm. long., triente inferiore sericeus, ceteroquin glaberrimus. Drupam non vidi.

Stirps ab *H. Burchellii*, Britton, ita distinguenda :—

Hirtella collina.	*H. Burchellii.*
Folia non bullata, summum subamplexicaulia, subtus plerumque puberula vel omnino glabra.	Folia bullata, amplexicaulia, subtus plus minus hirsuta.
Ramuli et paniculæ hirtulo-pubescentes.	Ramuli et paniculæ hirsutissimi.
Calyx extus hirtulus, intus pubescens.	Calyx hirsutissimus, intus hirsutus.
Petala oblonga vel anguste obovato-oblonga, vix 0·3 cm. long. et 0·15 cm. lat.	Petala obovato-oblonga, fere 0·4 cm. long. et 0·25 cm. lat.
Filamenta filiformia, tandem vix ultra 1·0 cm. long.	Filamenta crassiuscula, fere 1·5 cm. long.
Stylus inferne sericeus.	Stylus inferne longe villosus.

Ante oculos habui specimen Bolivianum in Hb. Kew. conserv., a cl. Rusby (N. 1222) lectum, quod cl. Britton (Bull. Torr. Bot. Club, xviii. p. 10) conspecificum cum plantâ Burchellianâ intuitur; ab illâ vero ex meâ sententiâ certe abhorret, et forsan pro specie tertiâ rite habendum paniculis hirsutissimis *H. Burchellii* et floribus parvis *H. collinæ*. [Bras. Or., Bolivia.]

COMBRETACEÆ.

Terminalia festinata (sp. nov.). Fruticosa, crebre ramosa, ramulis juvenilibus appresse sericeo-pubescentibus, dein fere glabris; foliis nondum evolutis parvis, petiolatis, appresse sericeo-tomentosis, adultis verisimiliter ovato-lanceolatis, acuminatis; floribus præcocibus in spicas abbreviatas densifloras ex axillis ramentorum parvorum singillatim ortas dispositis; bracteis ovarium excedentibus; ovario subtrigono, fructu ignoto.

Hab. Ad Santa Cruz floret mens. Oct. (N. 450.)

Rami nudi, usque ad 0·4–0·5 cm. diam., cortice cinereo levissime striato, mox transverse dirupto et evanido, interiorem cervinum proponente; ramuli teretes, 0·15–0·2 cm. diam., erecto-ascendentes. Ramenta parva, lanceolata vel ovato-lanceolata, longe acuminata, dorso sericea, mox pubescentia, 0·2–0·3 cm. long. Pedunculi erecti, graciles, appresse pubescentes, 1·0–2·0 cm. long. Spicæ 0·8–1·3 cm. long., circa 0·7 cm. diam., pleræque 15–24-floræ. Bracteæ lineari-subulatæ, appresse sericeæ, 0·2 cm. long. Flores lutei. Calycis appresse piloso-pubescentis usque ad medium 5-partiti lobi triangulares, acutiusculi, paullulum ultra 0·1 cm. long. Staminum antisepalorum filamenta brevia, vix 0·2 cm. long., staminum alternisepalorum usque ad 0·3 cm. long., filamenta omnia imâ basi pilosiuscula, æstivatione involuta. Antheræ cordatæ. Discus annulatus. Ovarium 0·12 cm. long., usque ad 0·05 cm. lat., dense sericeum. Stylus crassiusculus, 0·3 cm. long., dimidio inferiore sericeo-pilosus.

Species singularis, nulli mihi cognita affinis, habitu præcocifloro *T. Riedlii*, Eichl., in mentem revocat, abs quâ attamen pluribus de signis affatim distat.

Combretum secundum, Jacq. Sel. Stirp. Amer. Hist. p. 103.

Hab. Matto Grosso (*Leeson*, in Herb. Mus. Brit.). [Amer. Austr.]

MYRTACEÆ.

PSIDIUM (§ APERTIFLORÆ) INSULINCOLA (sp. nov.); ramulis pedunculisque hirsuto-pubescentibus; foliis brevissime petiolatis, chartaceis, lanceolatis, obtusis vel obtusiusculis, amplexicaulibus, præsertim ad nervum medium piloso-pubescentibus, mox glabris, utrinque elevato-glandulosis, supra subnitentibus, reticulatim et arcuatim nervosis; paniculâ terminali paucitlorâ, foliis hebetatis interjectis; calyce quam pedicellus longiore vel breviore, campanulato, aperto, subæqualiter 5-lobo (rarius lobis duobus, inseparatis inæqualiter 4-lobo), albido-tomentoso; ovario 2-loculari; fructibus pyriformibus tomentoso-pubescentibus, lobis calycinis persistentibus coronatis.

Hab. In insulis planis nacta fl. Paraguay tempore pluvioso inundatis inter Santa Cruz et Diamantino, ubi fl. et fruct. gerit mens. Oct. (N. 624.)

Frutex erectus, diffusus, ramosus, usque biorgyalis. Folia per paria inæqualia vel subæqualia, 4·0–10·0 cm. long., medio vix 2·0–3·5 cm. lat., nonnunquam subfalciformia, basi parum obliqua, margine leviter undulata vel undulato-repanda; costæ secundariæ utrovis latere circa 12, pluribus tertii ordinis adjectis, aperte arcuatæ, dein prope marginem sæpe dichotomæ, ibique conjunctæ, venulâ unâ cum costis utrinque prominulâ. Panicula foliis brevior; pedicelli 0·3–1·0 cm. long. Flores subcongesti, circa 1·5 cm. diam., albi. Calycis lobi rotundati, 0·2–0·4 cm. long., 0·4 cm. lat., intus pubescentes. Petala 1·0 cm. long., circa 0·7 cm. lat., oblongo-ovata, conspicue glandulosa. Filamenta vix 1·0 cm. long.; torus stamineus hirsutus. Ovarium circa 0·6 cm. long. et 0·3 cm. crass., teres, albido-tomentosum; stylus incurvus, 0·9 cm. long., apicem versus sensim angustatus, glaber. Fructus usque ad 3·2 cm. long., 1·5 cm. lat. (basi vix 0·3 cm. lat.), pedicellis 0·5–0·6 cm. long. tomentoso-pubescentibus suffulti, raro sessiles.

Species *P. paraensi*, Berg, arcte affinis, ob folia vero angustiora, minus amplexicaulia, ramulos hirsuto-pubescentes nec rufo-tomentosos, inflorescentiam laxiorem, flores pedicellatos, necnon ovarium biloculare (nec triloculare) optime dignoscenda. [Amazonia.]

PSIDIUM (§ COSTATA) TRIPARTITUM (sp. nov.). Ramosa, ramulis crebro foliatis, subteretibus, interdum compressiusculis, pubescentibus puberulisve, subinde glabris; foliis parvis, breviter petiolatis, lanceolatis vel ovato-lanceolatis, sæpe cuspidatis, rarissime oblanceolatis et retusis, raro ovatis et obtusis, nonnunquam breviter mucronulatis, basi angustatis, interdum obliquis, tenuiter coriaceis, supra nitidis, subtus paullo decoloribus, imâ basi puberulâ exemptâ glabris, elevato- et impellucido-punctatis; pedunculis axillaribus solitariis, unifloris, puberulis; alabastris pyriformibus, sub calyce constrictis, glabris; ovario 3-loculari glabro; calyce usque ad anthesin clauso demum tripartito; baccâ globosâ, polyspermâ.

Hab. Ad Corumbá floret et fructificat mens. Jan. (N. 971.)

Arbuscula vel potius frutex, circiter trimetralis. Ramuli cinerei, plerique 0·2–0·3 cm. diam., intervallis plerumque 1·0–2·0 cm. foliigeri. Folia pleraque 3·0–4·0 cm. long. (raro 4·5 cm. attingentia), 1·2–2·0 cm. lat., margine leviter vel levissima undulata, sæpe revoluta; costæ secundariæ utrinque plerumque 6–8, rectæ, sub

margine dichotomæ, ramis subinde margini parallelis arcuatim conjunctis; costa media supra impressa, subtus admodum prominens; petioli plerique 0·4 cm. long., puberuli. Pedunculi 1·0–1·2 cm. long., ascendentes, cito obsolete puberuli; alabastra obtusissima, in toto 0·7 cm. long., sursum 0·5 cm. lat., sub calyce ad 0·3 cm. angustata. Flores 1·5 cm. diam. Calycis lobi plerumque inæquales, ovati, obtusissimi, utrinque glabri. Petala 5, ovata, obtusissima, glabra, pellucido-punctata. Bacca sicca, paullo ultra 1·0 cm. diam., ex schedis meis magnitudine pruni parvi. Semina hippocrepica, 0·4 cm. diam. Embryo normalis.

Species distincta, cum nullâ hujus sectionis componenda.

Psidium Araçu, Raddi, Opus. Sc. iv. p. 854.

Hab. Floret et fructificat ad Santa Cruz menss. Oct. et Nov., itaque ad Jangada floret Sept. (Nn. 253, 770 *a.*) [Amer. Trop.]

Myrcia (§ Acuminatæ) Govinha (sp. nov.); ramulis, foliorum novellorum petiolis, et paginæ inferioris nervo medio pubescenti-tomentosis, demum glabriusculis; foliis breviter petiolatis, coriaceis, ovatis vel ovato-oblongis, cuspidatis, acuminatis, basi leviter coarctatis, reticulato-nervosis, crebre pellucido-punctatis, in sicco virescentibus, nequaquam decoloribus; paniculis ab axillis foliorum superiorum ortis vel subterminalibus, multifloris, maxime effusis, quam folia longioribus vel ea subæquantibus; germine 4-loculari, albo-sericeo; sepalis subæqualibus, obtusis, puberulis.

Hab. Viget in nemorosis ad Santa Cruz, mens. Dec. florens. Nom. vernac. *Govinha.* (Nn. 784 *a*, 784 *b*.)

Frutex elegans, ramosus. Caulis teres, cinereus; ramuli ultimi aliquanto compressi. Folia supra nitida, maxime inæqualia, 4·0–14·5 cm. long. (pleraque 9·0–11·0 cm. long.), 1·5–6·5 cm. lat.; costa media supra impressa, subtus eminens; costæ secundariæ utrinque circa 20, angulis latis insertæ, rectæ, sub margine costam marginalem undulatam incidentes, utrinque prominulæ; venulæ arctissime reticulatæ, supra eminentes; petiolus circa 0·5 cm. long., in sicco manifeste canaliculatus. Bracteæ caducæ, scariosæ, lanceolatæ vel lineares, circa 0·15–0·25 cm. long. Flores sessiles vel breviter pedicellati, 0·5 cm. diam. Alabastra depresse globosa, obtuse pentagona, pubescentia, 0·2 cm. diam. Sepala ovata, 0·13 cm. long. Petala late obovata, obtusissima, concava, vix 0·3 cm. long., 0·25 cm. lat. Germen circa 0·15 cm. long. et 0·1 cm. lat.; stylus crassiusculus, staminibus brevior. Fructus haud visus.

Species inter *M. ovatam*, Cambess., et *M. phæocladam*, Berg, medium tenens, ab ambabus vero primo intuitu diversa adjudicari paniculis effusis germine albo-sericeo 4-loculari.

The fruit is known as Fruito de Pombe, and its juice is said to yield a red indelible ink. [Bras. Or., Guiana.]

Myrcia ambigua, DC. Prod. iii. p. 252.

Hab. Floret ad Serra da Chapada mens. Aug. (Nn. 118, 145.)

Frutex altus vel arbuscula, trunco basi circa 60·0 cm. diam. [Bras. Or., Goyaz, Amazonia, Guiana.]

MYRCIA (§ TOMENTOSÆ) CHAPADENSIS (sp. nov.); caule primo lateraliter compresso vel subtereti, demum tereti, rufo-tomentoso; foliis majusculis, petiolatis, chartaceo-coriaceis, ovato-lanceolatis, acuminatis, vel minoribus et obtusis, basi sensim coarctatis, raro rotundatis, supra, nervo medio rufo-tomentoso excluso, glabris et virescentibus, subtus tenuiter rufo-tomentosis et decoloribus; paniculis axillaribus vel terminalibus, subeffusis, plurifloris, quam folia brevioribus vel subæquilongis; germine biloculari, apice albido-velutino; sepalis subæqualibus, obtusissimis, rufo-tomentellis.

Hab. Crescit ad Serra da Chapada, prope Santa Anna da Chapada, circa 600 met. supra mare. Fl. Aug. (N. 164.)

Arbor venusta, copiose florifera, circa 10 met. alt., e basi abunde ramosa, cortice cinereo obtecta. Foliorum majusculorum margine leviter undulatorum lamina ad 16·5 cm. long. et vix ad 6·5 cm. lat.; fol. minorum lamina, circa 5·0 cm. long.; costa media supra impressa, subtus valde eminens, costæ secundariæ et venulæ ut in *M. effusâ*; petiolus 0·6–1·2 cm. long., rufo-tomentosus, in sicco canaliculatus. Panicula compressa vel subteres, rufo-tomentosa. Flores sessiles vel subsessiles vel (interdum longius) pedicellati, circa 0·7 cm. diam. Alabastra globosa, obscure pentagona, tomentosa, 0·3 cm. diam. Sepala rotundata, tomentosa, pellucide glandulata, 0·2 cm. long. Petala ovata, obtusa, vix 0·5 cm. long., concava. Germen rufo-tomentosum, circa 0·15 cm. long. et crass., obconicum, subteres; styli filiformis stamina excedentis dimidium superius cum dimidio inferiore angulum obtusum vel rectum, nonnunquam vero acutum, formans. Fructus abest.

Videtur *M. Sellowianæ*, Berg, affinis, sed multis propriis dispar. [Bras. Or.]

MYRCIA (§ CORDIFOLIÆ) VERRUCULATA (sp. nov.); ramulis incanis, demum glabris; foliis breviter petiolatis, rigide coriaceis, ovatis vel ovato-lanceolatis, apice breviter mucronatis, basi leviter cordatis, juvenilibus præsertim in costâ centrali pilosis, mox glabris, pellucido-punctatis, adultis supra nitidulis, subtus decoloribus; costâ mediâ subtus admodum eminente, costis secundariis utrinque circa 7–8, pluribus tertii ordinis interjectis, angulis latis insertis, rectis vel fere rectis, mox in costam submarginalem desinentibus; venulis arctissime reticulatis, utrinque eminentibus; paniculis axillaribus terminalibusve, folia excedentibus; alabastris incanis; floribus ultimis solitariis vel binis; ovario albido-incano, 2-loculari, disco plano, baccâ globosâ vel depresse subglobosâ, sepalis patentibus, arcte applicatis, triangulari-ovatis, acuminatis, intus glabris coronatâ.

Hab. Ad Jangada floret mens. Sept. (N. 276.)

Ramuli subteretes, cortice tenuissimo cinereo lenticellifero obducti. Novelli compressi, incani. Folia maxime inæqualia, 2·0–7·0 cm. long., 1·2–3·5 cm. lat., marginibus revolutis; costa submarginalis undulato-fornicata, 0·3 cm. a margine folium percurrens; petioli sat incrassati, late canaliculati, dorso pubescentes, 0·3 cm. long. Paniculæ usque 5·0 cm. attingentes, pilosæ; ramuli ascendentes, 1·0–1·5 cm. long. Pedicelli sub flore circa 0·2–0·3 cm. long. Flos totus vix 0·5 cm. long. Ovarium 0·13 cm. diam., 4-ovulatum. Sepala 5, 0·3 cm. long., extus sericeo-pilosa, margine longe ciliata, post anthesin patentia, demum recurva. Petala ovata,

ciliolata, 0·4 cm. long. Bacca 2–3-sperma, 0·6–1·0 cm. diam., sæpe lobulata, parce pilosula, brunea. Semina usque 0·6 cm. long.

Juxta *Myrciam canescentem*, Berg, intercalanda, cujus folia minora, sessilia, subtus canescentia, nervo marginali nec submarginali percursa, paniculæ tomentosæ, etc. [Bras. Or.]

MYRCIA DASYBLASTA, Berg, in Mart. Fl. Bras. xiv. pars i. p. 207.

Hab. Frutex ramosus, metralis; floret ad Cuyabá mens. Aug. (N. 30.) [Matto Grosso.]

MYRCIA (§ CORDIFOLIÆ) COLLINA (sp. nov.); ramulis ultimis tomentellis, cito puberulis; foliis brevipetiolatis, parvis, coriaceis, ovato-oblongis, apice obtusissimis, raro retusis, basi leviter cordatis, cito utrinque glaberrimis, pellucido-punctatis; costis secundariis utrinque circa 10, supra eminentibus, subtus vix conspicuis, subrectis, a costâ marginali undulatâ conjunctis; venulis paucis sublaxe reticulatis; paniculis extra-axillaribus, folia excedentibus, paucifloris, haud raro racemosis; alabastris pubescentibus; ovario appresse pubescente, 2-loculari; floribus ultimis 1–3-nis; sepalis ovatis obtusissimis, mox patentibus, extus pubescentibus, intus puberulis; baccâ ignotâ.

Hab. Crescit in cacumine montium Serra da Chapada, ubi mens Aug. floret. (N. 93.)

Ramuli subtetragoni, deinde glabri et cortice tenui cinereo obtecti, 0·2–0·3 cm. diam., novelli compressi, minute pubescentes, in sicco fusco-rubescentes. Folia pleraque 2·5–3·5 cm. long., 1·3–2·3 cm. lat., supra vix nitidula, subtus pallida et fere evenosa, margine cartilaginea; petioli 0·1–0·15 cm. long., crassiusculi. Paniculæ circa 0·1–0·2 cm. ultra axillas ortæ, ascendentes, distantifloræ, mox glabræ, usque ad 5·0 cm. long.; ramuli non ultra 0·7 cm. attingentes, 1–3-flori. Pedicelli sub flore nunc usque 0·5 cm., nunc obsoleti. Alabastra subglobosa, circa 0·2 cm. diam. Flos totus circa 0·45 cm. long., 0·5 cm. diam. Ovarium circa 0·07 cm. diam., 4-ovulatum. Sepala paullo ultra 0·1 cm. long. Petala ovata, 0·33 cm. long., nonnunquam erosula.

Accedit ad *M. dasyblastam*, Berg, cujus folia parum diversiformia, flores vero longe alieni. [Matto Grosso.]

EUGENIA (§ UMBELLATÆ) SPARSA (sp. nov.); ramulis glabris, sat validis; foliis membranaceis, brevipetiolatis, oblongis vel oblongo-oblanceolatis, breviter mucronatis, basi longe et sensim angustatis, glabris, crebre pellucido-punctatis; costis secundariis circa 20, rectis, leviter decurrentibus, costâ marginali ad 0·2–0·3 cm. a margine folium percursante; pedicellis 2–4-nis, unifloris, e nodis defoliatis ortis; alabastris obovoideis, glabris; ovario biloculari; sepalis subæqualibus, rotundatis, obtusissimis, ciliolatis.

Hab. Crescit in ripâ fl. Paraguay inter Santa Cruz et Tres Barras, ubi floret mens. Oct. (N. 623.)

Rami subteretes, nodulosi, 2·5–5·0 cm. diam., cortice crassiusculo cinerascente plano vel rimoso obtecti. Folia sæpe subopposita, 8·0–11·5 cm. long., 3·0–3·5 cm. lat., supra haud nitida, subtus paullulum pallidiora; costa media supra alte impressa, subtus prominula; venulæ arcte reticulatæ, parum conspicuæ. Petioli 0·8 cm. long.,

anguste canaliculati, in sicco atrati. Pedicelli 0·3 cm. long., crassiusculi, pubescentes vel puberuli, basi bracteâ parvâ ovatâ vix 0·2 cm. long. muniti, et sub flore bracteolas duas ovatas acutas sub alabastris 0·1 cm. long., mox usque ad 0·2 cm. auctas ferentes. Flores albi, in sicco lutei. Ovarium cylindricum, obsolete puberulum, minute verrucosum, 0·25 cm. long. Sepala 4, 0·15 cm. long., post anthesin patula vel recurva. Petala 4, late ovata, 0·5 cm. long., ciliolata. Stamina 0·6 cm. et stylus 0·5 cm. long.

Mihi videtur ad *Eugeniam flavescentem*, DC., spectare, ob foliorum vero formam et magnitudinem, pedicellos abbreviatos, flores majores, certe non cum eâ conspecifica. [Bras. Or., Guiana.]

EUGENIA (§ RACEMOSÆ) TINGE-LINGUA (sp. nov.); ramulis racemisque sæpissime minute puberulis; foliis oppositis, coriaceo-membranaceis, petiolatis, lanceolatis vel ovato-lanceolatis, raro ovatis, breviter vel longiuscule obtuse cuspidatis, basi leviter angustatis et obtusis, sparse pellucido-punctatis; costis secundariis utrinque circa 8, rectis, costâ submarginali eximie arcuatâ ad 0·4–0·6 cm. a margine folium percursante; racemis quam folia brevioribus oppositis, lateralibus axillaribusve, 3–5-carpicis; baccâ subglobosâ, 1–2-spermâ, sepalis brevibus plus minus conniventibus coronatâ.

Hab. Frequens ad Santa Cruz et in vicinia, mens. Oct. fructificans. *Tinge lingua* incolarum, *Oumahung* Paraguariensium. (N. 463.)

Ramuli compressi, juniores in sicco brunei, demum cinerei. Folia 8·0–12·0 cm. long., 3·0–4·5 cm. lat., margine revoluto, supra haud nitida, subtus pallidiora; costa media supra alte impressa, subtus admodum eminens; costæ secundariæ et costa submarginalis supra obscuræ, subtus aliquanto prominulæ; venulæ arcte reticulatæ; petioli vix usque ad 1·0 cm. long., supra canaliculati, rugulosi, in sicco fusci. Racemi fructiferi 2·0–4·0 cm. long., ascendentes; pedicelli 0·3–0·5 cm. long., patentes, basi bracteâ parvâ ovatâ puberulâ circa 0·08 cm. long. aucti. Sepala 4, rotundata, ciliolata, supra fructum 0·1 cm. long. Flores non suppetebant. Bacca edulis, usque ad 0·8 cm. long. et diam. (sæpe vero circa 0·65 cm.), viva nigro-purpurea, in sicco verruculosa. Semen 0·5 cm. long.

Accedit ad *E. Gardnerianam*, Berg, cujus ramuli et racemi appresse hirti, folia latiora, pedicelli elongati pluriflori, etc.

From the fact of this plant being well-known to our Paraguayan peons, I infer for it a southward range, unless indeed, as is probable, the *Oumahung* be a nearly allied species of *Eugenia*. [Bras. Or.]

EUGENIA (§ RACEMOSÆ) PSEUDOVERTICILLATA (sp. nov.). Suffruticosa, erecta, ramulis subteretibus, strictis, molliter pubescentibus, primo tomentellis; foliis petiolatis, membranaceis, plerisque ternatim, rarius binatim, rarissime quaternatim verticillatis vel subverticillatis, nonnunquam plane solitariis, oblanceolatis, raro obovato-oblanceolatis, plerumque breviter ac late cuspidatis, obtusis, basi sensim cuneatis, utrinque molliter pubescentibus; costis secundariis parum conspicuis utrinque circa 12, rectis vel fere rectis, costâ marginali ad 0·1–0·15 cm. a margine folium percursante;

racemis axillaribus folia excedentibus vel subæquantibus, erectis, 3–6-floris, una cum pedicellis elongatis pubescentibus; floribus exiguis; ovario biloculari; sepalis ovatis, obtusis, ciliolatis, utrinque minute puberulis.

Hab. Ad Santa Cruz floret mens. Nov. (N. 607.)

Suffrutex semimetralis vel ultra. Ramuli e caule valido, sæpe procumbente et radicante, cortice papyraceo pallide ochraceo-puniceo obducto circa 0·7 cm. diam. assurgentes, 0·2–0·25 cm. diam., copiose foliati. Folia pleraque 4·0–5·0 cm. long., 1·2–1·5 cm. lat., subtus pallidiora, crebre pellucido-punctata; costa media supra plana, subtus prominula; venulæ inconspicuæ; petioli 0·3 cm. long., pubescentes. Racemi usque ad 6·0 cm. long., plerique attamen 3·0-4·0 cm., gracillimi; pedicelli patentes, filiformes, circa 0·7 cm. long., basi bracteâ minutâ lanceolatâ pubescente vix 0·1 cm. long. muniti, sub flore bracteolas duas parvas ovatas ciliolatas gerentes. Ovarium ovoideum, pubescens, 0·07 cm. long. Sepala 4, inæqualia, usque ad 0·12 cm. long. Petala ovata, ciliolata, 0·23 cm. long. Stamina et stylus 0·25 cm. long., hic puberulus. Baccæ desiderantur.

Species affinitate dubiâ et ob habitum, indumentum molliter pubescens, folia et flores exiguos facile recognoscenda.

Eugenia (§ Racemosæ) miniata (sp. nov.); ramulis gracilibus, puberulis, deinde glabris; foliis brevipetiolatis, parvis, chartaceis, glabris vel minutissime puberulis, lanceolatis, obtusis, nonnunquam leviter cuspidulatis, basi sensim attenuatis, supra haud nitidis, subtus pallidis; costis secundariis circa 12, oblique ascendentibus, utrinque obscuris, costâ marginali marginem fere attingente; racemis axillaribus terminalibusve quam folia brevioribus, gracillimis, 3–6-floris, puberulis; floribus minimis; pedicellis elongatis, patentibus vel ascendentibus; ovario 2-loculari, glabro; sepalis 4 inæqualibus, ovatis, ciliolatis; baccâ ignotâ.

Hab. Ad Cuyabá floret mens. Aug. (N. 14.)

Suffrutex parvus. Ramuli subteretes, 0·1–0·2 cm. diam., mox cortice tenui cinereo obducti. Folia 3·0–4·0 cm. long., 1·0–1·3 cm. lat., pellucido-punctata; costa media supra impressa, subtus parum eminens; petioli 0·2 cm. long. Racemi 1·5–vix 3·0 cm. long., ascendentes. Pedicelli filiformes, 0·7 cm. long., basi bractea subulata 0·1 cm. long. puberulâ stipati, et sub flore bracteolis duabus parvis ovatis ciliolatis onusti. Ovarium ovoideum, 0·06 cm. long. Sepala acuta vel obtusa, 0·1 cm. long. Petala 4, oblongo-ovata, 0·2 cm. long. Stylus 0·25 cm. long.

Verisimiliter præcedenti affinis, sed multis notis ab eâ dispar.

Eugenia (§ Stenocalyx) prolixa (sp. nov.); ramulis e caule valido piloso-pubescentibus, deinde glabris; foliis adultis chartaceis, breviter petiolatis, anguste lanceolato-obovatis, cuspidatis, acutiusculis, subtus, præsertim in nervis, sparse pilosis, ceterum glabris, crebro elevato-pellucido-punctatis; costis secundariis utrinque circa 8, rectis, costâ submarginali ad 0·3–0·4 cm. a margine folium percursante, admodum fornicatâ; pedunculis solitariis, oppositis, ex eâdem gemma 2–4, basi squamâ lineari-lanceolatâ

munitis; ovario piloso, 2-loculari, obscure costato; baccâ immaturâ ovoideâ, sepalis 4 ovatis, extus sericeo-pilosis, ascendentibus coronata.

Hab. Ad Santa Cruz mens. Oct. floret. (N. 410.)

Caulis e rhizomate crasso erectus, deorsum nudus, $\frac{2}{3}$-metralis, cortice tenui cinereo striatulo obtectus, basin versus 0·5 cm. diam. Ramuli patuli vel ascendentes, graciles. Folia adulta 11·0–12·0 cm. long. (raro modo 6·5 cm.), supra nitidula, subtus paullo decoloria; costa media supra impressa, subtus prominula; costæ secundariæ utrinque conspicuæ; venulæ subtus obscuræ; petioli 0·5 cm. long., puberuli, in sicco fusci. Pedunculi tenues, pubescentes, sub flore vix 1·0 cm. long., post anthesin usque ad 1·5 cm. elongati. Squamæ 0·5 cm. long., albo-sericeæ. Flores præcoces. Ovarium obovoideum. Sepala 4, inæqualia, obtusa vel acuta, ciliolata, 0·3 cm. long. Petala 4, oblonga, inferne parum attenuata, 0·8 cm. long. Filamenta 1·0 cm. long. Stylus vix 1·0 cm. long., a basi crassiusculâ sensim attenuatus. Bacca nondum matura 0·45–0·5 cm. long., obsolete pilosula.

Mihi videtur cum *Eugeniâ Michelii*, Lam., componenda, sed ob habitum disparem (*E. Michelii* equidem arbuscula saltem humanâ altitudine), folia multo majora, squamas sericeas, pedunculos pubescentes, præter alia, optime discrepat.

Ita variat:

Var. *vestita*, a typo distans præsertim foliis juvenilibus sericeo-tomentosis vel appresse sericeo-pubescentibus, squamis latioribus, floribus majoribus (petala equidem saltem 1·0 cm. long.), et ovario dense albo-sericeo.

Hab. Reperi ad Santa Cruz mens. Sept. florentem. (N. 295.) [Bras. Or.]

MELASTOMACEÆ.

MICROLICIA EUPHORBIOIDES, Mart. Nov. Gen. et Sp. iii. p. 107, var. PARVIFOLIA, Cogn.

Hab. In cacumine montium Serra da Chapada flores roseos præbet mens. Aug. (N. 146.) [Bras. Or., Goyaz.]

RHYNCANTHERA (§ ANISOSTEMONES) LEUCORRHIZA (sp. nov.); caule e radice fibroso et patulo et pilis albis densissime obtecto ascendente, basi quadrangulari, superne subtereti, sparsim piloso-hispido, demum glabro; foliis oppositis, breviter petiolatis, ovatis vel ovato-lanceolatis vel oblanceolato-oblongis, basi coarctatis vel rotundatis, nequaquam cordatis, obtusis, 3-nerviis, paginâ superiore pilis perpaucis strigosis appressis instructâ, pag. inf. fere omnino calvâ; floribus in axillis fol. superiorum solitariis, brevissime pedunculatis; calycis tubulosi medio leviter angustati piloso-hispidi dentibus tubo brevioribus.

Hab. In loco humido ad Santa Cruz (Barra dos Bugres) nitet atque mens. Oct. florescit. (N. 465.)

Herba ramosa, patula, circiter $\frac{1}{3}$ met. alt. Radicis fibræ primariæ circa 0·25 cm. crassæ, in sicco quasi pallide bruneo cinctæ, vivæ vero albæ. Folia inter se inæqualia (paria majora cum paribus exiguis mixta), 1·0–2·5 cm. long., 0·5–1·2 cm. lat., margine serrulato-pilosa, subtus in sicco pallida; petioli 0·3–0·4 cm. long.,

glabri vel pilosi. Pedunculus 0·1 cm. long. Flores purpurei. Calycis tubus 10-nervis, 0·65 cm. long., medio 0·2 cm. et basi vix 0·3 cm. lat.; dentes lanceolati, acuminati, vix 0·4 cm. long. Petala ovato-oblonga, obtusa, 1·3 cm. long. Staminis maximi filamentum lateraliter compressum, crassiusculum, 0·8 cm. long.; antheræ pes incurvus, haud rugatus, 1·0 cm. long., dimidio superiore incrassato, basi brevissime biapiculato; anthera ipsa superne sensim coarctata, 0·4 cm. long.; rostrum recurvum, filiforme, 0·5 cm. long.; staminum minorum filamentum circa 0·5 cm. long., pedi filiformi basi bicorniculato subæquilongum, antheræ et rostra iis stam. maj. similes; staminodia filiformia, vix 0·3 cm. long. Stylus 3·0 cm. long., undulatus. Fructus abest.

Videtur cum *Rhynchantherâ secundiflorâ*, Naud., specie mihi tantum ex descriptione cognitâ, comparanda, abhorrens vero indumento, foliis diversis, inflorescentiâ nequaquam paniculatâ, petalis minoribus obtusis, stylo longiore. [Paraguaria.]

RHYNCHANTHERA (§ ANISOSTEMONES) RIPARIA (sp. nov.). Ramosissima, ramis glanduloso-piloso-hispidis; foliis petiolatis, 5-nerviis (obscure 7-nerviis), ovato-lanceolatis, supremis lanceolatis, obtusis vel obtusiusculis, basi obtusis angustatisve, utrinque (subtus, præcipue secus nervos) pilis paucis strigosis appressis munitis, serraturis longe vel longiuscule simpliciter vel glanduloso apiculatis; calycis tubo (sub anthesi) utrinque aliquanto dilatato, lobis subsetaceis tubo æquilongis, calyce toto longe glanduloso-piloso-hispido; capsulâ ovoideâ, conspicue longitudinaliter nervosâ, sparsim piloso-hispidâ.

Hab. Ad ripas fl. Cuyabá prope Melgaço. Fl. Aug. (N. 6.)

Frutex circa 1 met. alt. Folia majora paginâ 4–4·5 cm. long. (fol. suprema vix 1·0 cm. long.), in sicco subtus pallidiora. Petiolus ad 1·5 cm. long., glanduloso-piloso-hispidus. Flores breviter pedicellati. Calycis tubus 0·6 cm. long., longitudinaliter nervosa. Petala purpurea, acutiuscula, vix 1·3 cm. long. Antheræ 0·8–0·9 cm. long. (rostro incluso). Capsula (an matura?) 0·7 cm. long., 0·5 cm. lat.

Ad *R. Hænkeanam*, DC., proxime accedit, abs quâ divergit ob habitum graciliorem, foliorum minorum indumentum dispar, calycis indumentum necnon lobos setaceos, flores minores, etc. [Peruvia.]

ACISANTHERA INUNDATA, Triana, in Trans. Linn. Soc. xxviii. p. 33, var. PUSILLA, Cogn.

Hab. Ad Santa Cruz floret mens. Dec. (N. 752.) [Bras. Or., Goyaz, Guiana.]

PTEROLEPIS TRICHOTOMA, Cogn. in Mart. Fl. Bras. xiv. pars iii. p. 261.

Hab. Crescit ad Santa Cruz, ubi mens. Dec. floret. (N. 753.) [Amer. Trop.]

TIBOUCHINA STENOCARPA, Cogn. in Mart. Fl. Bras. xiv. pars iii. p. 344.

Hab. Ad Serra da Chapada floret mens. Aug. (Nn. 82, 110.) [Bras. Or., Goyaz, Bolivia.]

ACIOTIS DICHOTOMA, Cogn. in Mart. Fl. Bras. xiv. pars iii. p. 460, var. LONGIFOLIA, S. Moore. Planta 15·0–20·0 cm. alt., caule distincte alato, interdum fere glabro; foliis lanceolatis, 3-nerviis (obscure 5-nerviis), inferne sensim in petiolum attenuatis usque ad 5·5 cm. long.; floribus fructibusque quam in typo leviter majoribus.

Forma inter *A. dichotomam*, Cogn., et *A. amazonicam*, Cogn., medium tenens, sed vix, ex meâ sententiâ, species propria.

Hab. In paludibus ad Santa Cruz floret mens. Dec. (N. 730.) [Guiana, Venezuela, Ins. Trinitatis.]

ACIOTIS INDECORA, Triana, in Trans. Linn. Soc. xxviii. p. 52.

Hab. Crescit ad Santa Cruz, mens. Dec. florens. (N. 471.)

Flores albi; antheræ purpureæ. [Bras. Or., Amazonia, Guiana, Peru.]

MICONIA TOMENTOSA, D. Don, in Mem. Wern. Soc. iv. 2, p. 316.

Hab. Reperi ad Santa Anna da Chapada. (N. 143.) [Bras. Or., Amazonia, Guiana, Ins. Trinitatis.]

MICONIA LEPIDOTA, DC. Prod. iii. p. 180.

Hab. Ad Santa Cruz floret mens. Dec. (N. 782 *a*.) [Amazonia, Guiana, Nov. Granat., Peruvia, Bolivia.]

MICONIA ALBICANS, Triana, in Trans. Linn. Soc. xxviii. p. 116.

Hab. Juxta Santa Anna da Chapada floret mens. Aug. (Nn. 89, 138.) [Amer. Trop., Ind. Occ., Paraguaria.]

MICONIA FALLAX, DC. Prod. iii. p. 181.

Hab. Ad Serra da Chapada mens. Aug. floret. (N. 156.) [Bras. Or., Amazonia, Paraguaria.]

MICONIA STENOSTACHYA, DC. Prod. iii. p. 181.

Hab. Crescit in ripis fl. Paraguay juxta Tres Barras, itaque ad Santa Cruz; menss. Oct.–Nov. floret et fructificat. (Nn. 420, 490, 610.)

There are two forms of this plant, if, indeed, they be not two distinct species. One of these, the *Miconia argyrophylla*, Benth. (non DC.), has fruits not more than half the size of the other form. My n. 610 belongs to the latter, the other two to the former of these. [Amer. Trop., Ind. Occ.]

MICONIA HELIOTROPOIDES, Triana, in Trans. Linn. Soc. xxviii. p. 116.

Hab. Viget ad Santa Cruz, mens. Nov. florens. (Nn, 345, 469.) [Goyaz.]

MICONIA PRASINA, DC. Prod. iii. p. 188.

Hab. Ad Santa Cruz floret et fructificat mens. Nov. (N. 457.) [Amer. Trop., Ind. Occ., Paraguaria.]

MICONIA (§ EUMICONIA, PANICULARES) CORALLIOCARPA (sp. nov.); ramulis patulis, petiolis paniculisque adpresse tomentoso-setulosis; foliis longe petiolatis, ovatis vel ovato-ellipticis, obtusis vel cuspidatis, crenato-dentatis, basi angustatis ibidemque plus minus obliquis, plerumque supra basin 7-nerviis, interdum vero 6-nerviis, paginâ superiore præcipue secus nervos pilis strigosis adpressis hirtis, pagina inferiore præcipue secus nervos adpresse hirsutis; paniculis gracilibus, quam folia brevioribus, subspicatis, paucifloris; floribus 5-meris, sessilibus, basi strigillosis; calycis strigoso-pubescentis tubo campanulato, limbo truncato, obscure 5-denticulato; petalis lineari-spathulatis, apice undulatis, glabris; staminibus subæqualibus, filamentis glabris; connectivo infra loculos breviter producto, basi inappendiculato; ovario triloculari, dimidio superiore libero.

Hab. Serra da Chapada, ad 1000 ped. alt. Fl. Aug.

Frutex, 4 met. alt. Petioli 1·5–6·0 cm. long., strigoso-hirsuti. Foliorum pagina 8·0–20·0 cm. long., 4·5–12·0 cm. lat., subtus pallida. Calyx vix 0·5 cm. long. Petala alba, 0·5 cm. long., 0·15 cm. lat. Filamenta tenuissima, superne levissime incrassata, obscure flexuosa, 0·4 cm. long.; antheræ lineares, attenuatæ, fere rectæ, vix 0·5 cm. long., 0·3 cm. crassæ, loculis undulatis. Ovarium ovoideum. Stylus tenuis, rectus, apice incrassatus, truncatus, vix 1·0 cm. long. Bacca immatura corallina, ovoidea, 0·5 cm. long., 0·35 cm. crassa.

Ex affinitate *M. Pseudo-nervosæ*, Cogn., cujus folia vix oblique angustata, paniculæ plurifloræ longiores et robustiores, calyx paullo major setulosus, petala rubra breviora et latiora, staminum breviorum et crassiorum connectivum basi vix productum, stylus brevior, bacca fuscescens. [Bras. Or., Goyaz.]

TOCOCA FORMICARIA, Mart. ex DC. Prod. iii. p. 165.

Hab. Ad Serra da Chapada floret mens. Aug. (N. 120.)

I saw no ants upon this plant. [Bras. Or., Goyaz.]

CLIDEMIA HIRTA, D. Don, in Mem. Wern. Soc. iv. 2, p. 309.

Hab. Crescit ad Santa Cruz, mens. Dec. florens. (N. 795.)

CLIDEMIA HIRTA, D. Don, var. ELEGANS, Griseb.

Hab. Crescit ad Santa Cruz, necnon in ripâ fl. Paraguay inter Santa Cruz et Tres Barras. (Nn. 507, 799*a*.)

The specimens gathered from the latter locality have large berries from 1 to nearly 1·5 cm. in length and not much less in breadth. Cogniaux describes the berry, the length of which he gives as only 0·8 cm.) as "nigricans," but in the 'Botanical Magazine' (sub tab. 1971) it is said to be blue. My fruits were green below and purple above, and apparently not quite ripe: I did not try their edible qualities. [Amer. Trop., Ind. Occ., Ind. Arch.]

CLIDEMIA RUBRA, Mart. Nov. Gen. et Sp. iii. p. 152, var. INTERMEDIA, S. Moore; foliis 3·5–6·0 cm. long., ovato-lanceolatis, acuminatis.

Hab. Crescit in cacumine montium Serra da Chapada, ubi mens. Aug. simul floret et fructificat. (Nn. 88, 99.) [Amer. Trop.]

Clidemia spicata, DC. Prod. iii. p. 159.
Hab. Ad Santa Cruz floret mens. Oct. (N. 496). [Amer. Trop., Ind. Occ.]

Mouriria guianensis, Aubl. Pl. Guian. i. p. 453.
Hab. In ripa fl. dos Bugres mens. Oct. floret. (N. 437.) [Braz. Or., Amazonia, Guiana.]

LYTHRACEÆ.

Cuphea micrantha, H. B. K. Nov. Gen. et Sp. vi. p. 196.
Hab. Ad Serra da Chapada mens. Aug. et ad Santa Cruz Dec. floret. (Nn. 111, 755.) [Amer. Austr. Trop., Ind. Occ.]

Cuphea retrorsicapilla, Koehne in Mart. Fl. Bras. xiii. pars ii. p. 279.
Hab. Ad Santa Cruz mens. Nov. reperi florentem. (N. 597.) [Braz. Or., Goyaz.]

Cuphea Melvilla, Ldl. Bot. Reg. sub tab. 852.
Hab. Crescit in ripâ fl. Paraguay, mens. Dec. florens. (N. 767.) [Amer. Austr. Trop. et Subtrop.]

Physocalymna scaberrimum, Pohl, in Flora, x. (1827) p. 153.
Hab. Serra da Chapada, etiam (fructificans) Santa Cruz mens. Nov. Floret Aug. (Nn. 122, 454.) [Goyaz, Amazonia, Peru, Bolivia.]

ONAGRACEÆ.

Jussiæa nervosa, Poir. Encyc. Suppl. iii. p. 199.
Hab. Frequens ad Cuyabá et ad Serra da Chapada. (N. 42.) [Bras. Or., Goyaz, Guiana, Nov. Granat.]

Jussiæa suffruticosa, Linn. Sp. Pl. ed. I. p. 388.
Hab. Floret ad Corumbá mens. Jan. (N. 1091.) [In tropicis late disseminata.]

Jussiæa decurrens, DC. Prod. iii. p. 56.
Hab. Crescit ad Santa Cruz, mens. Dec. florens et fructificans. (N. 781.) [America ab Amazonia et Nov. Granat. usque ad Carolinam.]

Jussiæa pilosa, H. B. K. Nov. Gen. et Sp. vi. p. 101.
Hab. Reperi ad ripas fl. Cuyabá prope Melgaço mens. Aug. fructificantem. (N. 5.) [Amer. Trop. et Subtrop., Afr. Trop.]

SAMYDACEÆ.

Casearia (§ Iroucana) riparia (sp. nov.) Inermis, ramulis juvenilibus fulvo-tomentosis, paulisper glabris; foliis ad apices ramorum confertis, obovato-oblongis, nunc obtusissimis, nunc breviter obtuse cuspidatis, margine glanduloso-denticulatis vel crenulatis,

tenuiter membranaceis, basi in petiolum brevem gradatim attenuatis, crebre pellucido-punctatis, supra cito, costis pubescentibus exceptis, fere glabris, subtus molliter pubescentibus; costis secundariis utrinque 6–7, aperte arcuatis, sub margine undulatim conjunctis; florum fasciculis solemniter ad nodos defoliatos sessilibus, paucifloris; pedicellis floribus parvis æquilongis, una cum calyce appresse pubescentibus; capsulâ subglobosâ, pilosâ.

Hab. Ad ripas fl. Paraguay prope Santa Cruz mens. Oct. simul floret et fructificat. (N. 509.)

Ramosa; ramuli ascendentes vel divaricati, subteretes, leviter undulati, cortice cinereo leviter striato obtecti, usque ad 0·4 cm. diam. Folia 5·0–7·0 cm. long., 2·5–3·0 cm. lat., inferne longe et sensim cuneata; costæ subtus setis prominulæ; venulæ laxæ, reticulatæ, obscuræ; glandulæ nunc circulares, nunc bacterioideæ; petioli 0·3 cm. long., fulvo-tomentosi. Stipulæ minutæ, caducæ, lineari-subulatæ, modo 0·2 cm. long., fulvo-tomentosæ. Pedicelli pubescentes, 0·2 cm. long. Calycis pubescentis lobi alte partiti, lineari-oblongi, obtusi, 0·25 cm. long. Stamina 8, glabra, basi cum disci lobis connatas. Disci lobi late lineares, filamentis æquilongi, intus barbati. Ovarium ovoideo-oblongum, pilosum, in stylum brevem pilosum desinens. Stigma discoideum. Capsula vix matura 0·3–0·35 cm. long. Semina non suppetebant.

Accedit ad *Caseariam hirtam*, Sw., abhorret attamen, præter alia, habitu inermi, foliis tenuibus minoribus, stipulis abbreviatis, floribus exiguis, capsulis parvis pilosis. [Nov. Granat., Ind. Occ.]

Casearia javitensis, H. B. K. Nov. Gen. et Sp. v. p. 366.

Hab. Ad Santa Cruz floret mens. Nov. (N. 470.) [Amer. Trop.]

TURNERACEÆ.

Piriqueta viscosa, Griseb. Cat. Pl. Cub. p. 114, subsp. australis, Urban.

Hab. Crescit in ripâ fl. Paraguay ad Dourados, mens. Aug. florens. (N. 12.) [Bras. Or., Guiana, Venezuela, Ind. Occ., Paraguaria.]

Piriqueta lanceolata, Benth. in Hook. Journ. Bot. iv. p. 117. (P. cistoides, Mey.), var. latifolia, Urb.

Hab. Reperi ad Santa Cruz mens. Nov. florentem et fructificantem. (N. 590.) [Amer. Trop., Ind. Occ.]

Piriqueta fulva, Chapm. Fl. South. U. S. p. 146.

Hab. [America a Matto Grosso et Bahia usque ad Carolinam Sept.]

Turnera (§ Leiocarpæ ?) chrysodoxa (sp. nov.); caulibus erectis, 24–29 cm. alt., crassis prorsus lutescenti-villoso-tomentosis, apicem versus foliatis, ceterum fere nudis; foliis subsessilibus, nunc obovatis, nunc oblongo-ovatis, obtusis, nonnunquam vero distincte breviter bilobis, subtus basi glandulis duabus (utrinque unâ) crateriformibus

rubellis gaudentibus; pedunculis brevissimis adnatis; prophyllis lineari-lanceolatis, villoso-tomentosis, circa 0·4 cm. long.; floribus axillaribus, iis ex axillis superioribus ortis subcongestis ex axillis inferioribus sparsis; calyce tertiâ parte coalitâ 1·5 cm. long., filamentis subæquilongis, stylis subæqualibus penitus pilosis, ovario ultra 20-ovulato, fructu non viso.

Hab. In campis siccis apricis ad Serra da Chapada alt. circa 1800 ped. Fl. Aug. (N. 184.)

Caules e rhizomate lignoso, vix ad 1·5 cm. crass., cortice fusco obtecto globati, 0·25 cm. crass., siccitate striati, infra foliis hebetatis passim gaudentes. Folia congesta, 1·0–3·0 cm. long., 1·0–2·5 cm. lat., inæqualiter crenato-serrata, tomentosa, subtus decoloria, glandula vix 0·1 cm. diam. Flores lutei. Calycis hirsuti tubus 10-nervius, intus pilosulus, 0·5 cm. long.; lobi lineari-lanceolati, 3-nervii vel, nervis duobus debilitatis utrinque adjectis, 7-nervii, nervo medio superne breviter producto, acuti, 1·0 cm. long. Petala obovata, obtusa, glabra, delicatula, calycis lobos parum excedentia. Filamenta tubo calycino vix 0·15 cm. long. adnata, a lateribus maxime compressa, glabra, 0·4–0·5 cm. long. Styli multipartiti, 0·5–0·7 cm. long.; flagelli longiores 0·5 cm. long. Ovarium hirsutum, subglobosum, 0·2 cm. long.

Nisi ad sectionem Leiocarpæ non referri debeat hæc stirps, arcte est *T. dolichostigmati*, Urban, affinis, speciei ex descriptione optimâ a cl. Urbano proditâ mihi tantum cognitæ, distare vero ab eâ videtur caulis indumento tomentoso-villoso, altitudine majore, foliis superne congestis nonnunquam bilobis, calyce majore, petalis diversis, filamentis subæquilongis, stylis brevioribus et penitus pilosis. [Bras. Or.]

TURNERA ODORATA, Rich. in Act. Soc. Nat. Hist. Paris, 1792, p. 107.

Hab. Ad Santa Cruz floret mens. Oct. (N. 476. [Goyaz, Guiana, Venezuela, Ins. Trinitatis.]

PASSIFLORACEÆ

PASSIFLORA FŒTIDA, Linn. Sp. Pl. ed. I. p. 959; var. STRIGOSA, S. Moore; caule fere omnino glabro, foliis pilis sparsis appresse strigosis munitis.

Hab. In ripâ fl. Paraguay inter Santa Cruz et Villa Maria, itaque juxta Corumbá. Floret menss. Dec. et Jan. (Nn. 820, 915.) [Amer. Trop.]

PASSIFLORA TRICUSPIS, Mast. in Mart. Fl. Bras. xiii. pars i. p. 587.

Hab. Ad Santa Cruz floret et fructificat mens. Nov. (N. 579.)

Folia saturate viridia. Flores albi. Nom. vernac. *Mão d'Anta.*

PASSIFLORA TRICUSPIS, Mast., var. MINOR, S. Moore.

Hab. Crescit ad Santa Cruz, ubi flores albos præbet mens. Dec. (N. 793.) [Bras. Or., Goyaz.]

PASSIFLORA COCCINEA, Aubl. Pl. Guian. ii. p. 828.

Hab. Reperi in sylvestribus ad Santa Cruz, ubi mens. Sept. floret. (N. 312.) [Amazonia, Guiana, Peruvia.]

PASSIFLORA VITIFOLIA, H. B. K. Nov. Gen. et Sp. ii. p. 138.

Hab. Crescit ad Santa Cruz, necnon in ripâ fl. Paraguay inter Santa Cruz et Tres Barras. (Nn. 498, 824.) [Amer. Trop.]

PASSIFLORA CINCINNATA, Mast. in Gard. Chron. 1868, p. 966.

Hab. Ad Corumbá floret mens. Jan. (Nn. 917, 961.) [Bras. Or.]

CUCURBITACEÆ.

MOMORDICA CHARANTIA, Linn. Sp. Pl. ed. I. p. 1009.

Hab. Vulgatissima, viget ad Corumbá. (N. 904 *a.*) [Per regiones tropicas utriusque orbis late diffusa.]

ANGURIA GLORIOSA (sp. nov.); foliis trifoliolatis, foliolis oblongis vel oblongo-obovatis, margine lobulatis vel lobulato-dentatis, rarius fere integris, glaberrimis, lateralibus asymmetricis, semicordatis vel unilateraliter truncatis; floribus magnis; calyce ventricoso; antheris elongatis, rectis, anguste lineari-lanceolatis, appendice lanceolata majusculâ papillosâ instructis.

Hab. Crescit in sylvestribus ad Santa Cruz, ubi flores mens. Nov. præbet. (N. 659.)

Caulis in sicco striatus, glaber vel minutissime puberulus. Petioli crassi, patuli, glabri vel obsolete puberuli, plerique 2·5–3·5 cm. long., petioluli usque 1·0 cm. long. Foliola viva saturate viridia, sicca pallentia, subtus pallidiora, apice breviter cuspidato-acuminata, fol. terminalia lateralibus similia nisi basi æquilaterali cuneatim angustata, pleraque 8·0–14·0 cm. long., 4·5–7·0 cm. lat.; costæ secundariæ paucæ, angulis latis insertæ, apertæ, arcuatæ; costæ omnes utrinque planæ. Cirrhi nonnunquam usque ad 20·0 cm. long., sat validi, striati, glabri vel imâ basi obsolete puberuli. Pedunculus communis elongatus, basi obsolete puberulus, crassiusculus, 13·0–22·0 cm. long., apice circa 8–12-florus. Flores rubri, inferiores longe (usque ad 2·5 cm.) vel breviter pedunculati, superiores verisimiliter sessiles. Calycis viridis puberuli tubus inferne ventricosus, striatus, 1·2–1·5 cm. long., basi 0·5–0·6 cm. lat., superne usque ad 0·27 cm. sensim coarctatus, intus superne pubescens; lobi lanceolati vel triangulari-lanceolati, erecti, 0·3–0·5 cm. long. Petala oblonga vel ovata, obtusa, nervosa, basi late unguiculata, extus glabra, intus basi levissime pilosula, 2·3–3·3 cm. long., 1·2–2·0 cm. lat. Antheræ (appendice inclusâ) 1·1 cm. long., 0·12 cm. lat., appendice 0·15 cm. long. Flores feminei et fructus non suppetebant.

Sine dubio accedit ad *A. grandifloram*, Cogn., cujus vix varietas ob foliola minora brevius petiolata, margine haud integerrima, calycis longioris tubum ventricosum nec cylindraceum, intus apice pubescens nec longe denseque villosum, petala minora nequaquam villosa, antheras longiores, angustiores, longius appendiculatas. [Peruvia, Bolivia.]

A transverse section of this beautiful plant's stem shows ten vascular bundles, of course bicollateral. Four of these are larger and central, six smaller are peripheral. Comparing a section with one of such a familiar type as the vegetable marrow, the much closer arrangement of the central bundles will be noticed; this closeness of

position causes much compression of the internal phloëm. The cortex is less voluminous than is that of the vegetable marrow, so much so that the outer bundles often run close to the sclerenchyme ring, which latter greatly resembles that of the vegetable marrow; as is so frequently the case with Cucurbitaceæ, there are small sieve-tubes in the cortex; the collenchyme is but slightly developed. I have had no opportunity of examining the leaf-traces.

CACTACEÆ.

PERESKIA BLEO, DC. Prod. iii. p. 475.

Hab. Ad Corumbá floret mens. Jan. (N. 955.) [Bras. Or., Nov. Granat., Amer. Centr., Mexico.]

FICOIDEÆ.

MOLLUGO GLINOIDES, Cambess. in A. St.-Hil. Fl. Bras. Merid. ii. p. 171.

Hab. Crescit in ripâ fl. Paraguay inter Santa Cruz et Tres Barras. (N. 634.) [Bras. Or., Cuba, Chili, Argentina.]

GAMOPETALÆ.

RUBIACEÆ.

LADENBERGIA (§ CASCARILLA) CHAPADENSIS (sp. nov).; ramis crassis, subobsolete tetragonis, sursum complanatis, obscure puberulis vel glabris, nunc fistulosis, nunc solidis; foliis modice petiolatis, late ovatis, obtusis, basi obtusis vel rotundatis, supra glaberrimis, subtus, præsertim secus nervos, piloso-puberulis, margine revolutis, obsolete undatis vel integris; inflorescentiâ terminali, abbreviatâ, subthyrsoideâ; bracteis exiguis, nunquam foliaceis; bracteolis binis minutis, sæpe diu persistentibus; pedicellis crassiusculis; ovario oblongo-turbinato, rufulo-tomentello; alabastris superne angustatis; calyce cupulari, usque ad medium 5-lobo, lobis ovatis, obtusissimis, obsolete puberulis; corollâ floris longistyli tantummodo a nobis scrutati in lacineas lineares, obtusas, crassiusculas, extus una cum tubo tomentellas divisa; staminibus juxta medium tubum affixis; antheris linearibus, obtusis, alabastri tubo duplo brevioribus: disco cupulari, saltem in sicco compresso; stylo alabastri tubum subæquante; capsulis linearibus utrinque parum angustatis, sæpissime unilateraliter dehiscentibus; seminibus anguste fusiformibus, utrinque caudatis et plus minus erosulis, nucleo parvo elliptico.

Hab. Crescit in cacumine montium Serra da Chapada, alt. circa 700 met. super mare, mens. Aug. florens et fructificans. (N. 144.)

Frutex altus (vel potius arbuscula ?), circa 3-metralis. Ramuli 0·4–0·5 cm. diam., cicatriculis soleæformibus foliorum dilapsorum notati, cortice cinereo vel fusco, leviter striatulo obducti. Foliorum lamina usque ad 17·0 cm. long. et 12·0 cm. lat. (mediocria vero 12·0×7·5 cm.), coriacea, plerumque siccitate aliquanto rubescens, facie superiore polita, subtus pallidior; costæ secundariæ utrovis latere 6–10, plerumque subopposite et oblique insertæ, primo fere rectæ, sub margine arcuatim incurvæ, ibique plerumque parum prominulæ, aliter una cum costâ mediâ eminentes; petioli

1·0–3·0 cm. long., validi, facie superiore anguste canaliculati, obsolete puberuli. Stipulæ ovato-oblongæ, obtusæ, pleræque 2·0 cm. long. Inflorescentia tempore florendi non ultra 10·0 cm. long. et 6·0 cm. diam.; rhachis tetragona, rufo-tomentella, mox puberula. Bracteæ usque ad 0·3 cm. long., lanceolato- vel triangulari-subulatæ; bracteolæ vix 0·1 cm. long. Ovarium, sub flore aperiente, 0·4 cm. long. Calyx 0·32 cm. long., 0·35 cm. diam., intus obsolete puberulus. Floris aperientis corolla 2·3 cm. long., alba; tubus 1·5 cm. long. et vix 0·2 cm. diam.; limbi lobi 0·8 cm. long., vix 0·1 cm. lat., intus rufulo-puberuli. Stamina 0·25 cm. supra basin affixa; antheræ 0·35 cm. long. et 0·07 cm. lat. Stigmata 0·3 cm. long. Capsulæ pleræque 4·0–5·0 cm. long., vix usque ad 0·5 cm. diam., calyce persistente connatæ. Semina 1·0–1·4 cm. long.; nucleus 0·25 cm. long., 0·13 cm. lat.

Accedit ad *Ladenbergiam magnifoliam*, Klotzsch, sed plane abhorret foliis minoribus, inflorescentiâ abbreviatâ subthyrsoideâ, calycibus plane majoribus segmentis latioribus obtusissimis, alabastris diversiformibus, corollæ lobis disparibus elongatis, antheris multo brevioribus, disco altiore, capsulis angustioribus plerumque uno latere dehiscentibus. Propius etiam videtur plantæ Venezuelianæ (Moritz, n. 965 in Herb. Brit. Mus.), cujus capsulæ iis stirpis nostræ simillimæ, sed flores ante oculos non habui et folia indumento et nervatione dispari gaudent, bracteas insuper multo majores ostendit.

The habit of the capsules of splitting usually down one side only is very peculiar, and were it universal might well justify the making of a new genus. But I find that one of my capsules has split in the regulation way, and, as all the other characters are those of *Ladenbergia*, I have decided upon describing my plant as a member of that genus. [Peruvia, Nov. Granat., Venezuela.]

Manettia, sp. indet.; caule pubescente, nunc puberulo; foliis lanceolato-obovatis, plerumque gradatim acuminatis, puberulis, usque ad 10·0 cm. long. et 4·0 cm. lat., plerisque vero minoribus; petiolis pubescentibus usque ad 3·0 cm. long., superne paullo ampliatis; pedunculis pubescentibus; calycis laciniis linearibus, 0·2 cm. long. Nec flores expansi nec fructus suppetebant. Flores, ex schedis meis, coccinei.

Hab. Crescit ad Santa Cruz, mens. Nov. florens. (N. 553.)

Sipanea pratensis, Aubl. Pl. Guian. i. p. 147. (*S. hispida*, Benth. MSS.)

Hab. Ad Santa Cruz mens. Dec. flores puniceos præbet. (N. 801.)

I have named this plant as above in deference to Dr. K. Schumann, who unites several forms which, at first sight, look very distinct. My specimens agree fairly well with Spruce's, except in the uniformly smaller size of their parts. [Amer. Austr. Trop.]

Sipanea (§ Panisea) veris (sp. nov.). Herbacea, caule procumbente, hinc atque illinc radicante; caulibus floriferis, erectis, raro ramulosis, gracilibus, appresse pubescentibus; foliis parvis, petiolatis, ovatis vel ovato-lanceolatis, obtusis vel obtuse acutis, nonnunquam obscure mucronulatis, basi plus minus acutatis, fere omnino glabris; inflorescentiâ spurie terminali cicinnoideâ, 1–2-florâ; rhachi gracili, subtereti, appresse pubescente; bracteis lineari-lanceolatis, ovario brevioribus vel subæqualibus; ovario

ovoideo, appresse strigoso-pubescente; calycis lobis elongatis, subulato-setaceis, ovarium circa 3-plo excedentibus, appresse puberulis; corollâ hypocraterimorphâ, calycem circa 2-plo superante, laciniis obovatis, obtusissimis, extus glabris, tubum plus quam $\frac{1}{2}$ excedentibus; tubo extus in nervis minutissime et appresse albo-puberulo, intus superne, præsertim fauce, aureo-villoso, inferne puberulo; staminibus paullo supra medium tubi affixis; filamentis brevissimis, quam antheræ multo brevioribus; stylo quam tubus breviore, stigmatibus elongatis coronato; capsulâ (immaturâ) complanato-subglobosâ, pilis brevibus strigosis obtectâ; seminibus . . .

Hab. Crescit in apertis arenosis ad ripas fl. dos Bugres, itaque ad confluentes fll. Paraguay et dos Bugres prope Santa Cruz. Floret Oct. (N. 435.)

Caules omnes tenues, radicantes, nec ultra 0·75 cm. diam., nodis tumidis. Folia usque ad 2·0 cm. long. (mediocre 1·5 cm.), 0·5–0·8 cm. lat., tenuiter membranacea, costæ secundariæ perpaucæ, obscuræ, obliquæ; petioli 0·1–0·2 cm. long., patuli vel ascendentes; stipulæ ovatæ, 0·1 cm. long. Flores punicei, nunc sessiles vel subsessiles, nunc pedicellis brevissimis fulti. Ovarium floris expansi 0·15 cm. long. et 0·1 cm. diam. Calyx usque ad 0·5 cm. long., pars indivisa brevissima et laciniæ usque ad 0·45 cm. long.; glandulæ interstitiales minutæ, rubræ. Corollæ tubus plerumque 0·8–1·0 cm. long. et 0·1 cm. diam., dimidio superiore ampliatus; limbus circa 1·0 cm. diam., lobi 0·6 cm. long. Stamina 0·5 cm. a basi affixa, filamenta non ultra 0·1 cm. antheræ 0·25 cm. long. Stylus 0·25 cm. long., apice in stigmata 0·15 cm. long. desinens. Capsula immatura 0·35 cm. long., 0·27 cm. lat.

Sipaneæ bifloræ, Linn. fil., affinis, sed distinctissima ob habitum humiliorem, folia minora, calycis majoris lobos latiores, corollam breviorem, antheras subsessiles et longiores, necnon stylum et stigmata disparia. [Bras. Or., Guiana, Venezuela.]

Sabicea novo-granatensis, K. Schum. in Mart. Fl. Bras. vi. pars vi. p. 303.

Hab. Crescit ad Santa Cruz, ubi flores albos præbet mens. Dec. (N. 785.)

Sabicea humilis (sp. nov.); caulibus e rhizomate valde incrassato humilibus, erectis, simplicibus, subtetragonis, junioribus (saltem in sicco) lateraliter compressis prorsus dense lanugino-tomentosis; foliis subsessilibus, oblongis ovatis vel anguste obovato-oblongis, nunc obtusis, nunc obtusissimis, nunc acutis vel brevissime acuminatis, basi acutis vel obtusis, supra longiuscule et appresse tomentoso-pubescentibus, dein pubescentibus, subtus dense et molliter albo-lanato-tomentosis; stipulis late ovato-rotundatis, acutis vel breviter acuminatis; inflorescentiâ axillari plurifiorâ; bracteis exterioribus late ovatis acutis, dorso præsertim inferne et intus basi villosulis, margine longe ciliatis; bracteolis linearibus vel spathulatis, dorso villosis; ovario 4-loculo, dense villoso; calyce ovario æquilongo, segmentis inæqualibus, lanceolatis obtusis, parte indivisâ multo longioribus, extus villosulis, intus fere glabris; corollâ calycem plus quam duplo superante, ad $\frac{1}{3}$ in lacinias oblongas, obtusas, extus villosulas, intus minutissime puberulas divisâ; corollæ tubo extus fere glabro, intus parce villoso, ceteroquin minute puberulo; staminibus juxta medium tubum affixis, inclusis, filamentis brevissimis; antheris oblongis, obtusis,

integris; stylo corollæ tubum subæquante, apice in lacinias stigmatosas sat elongatas 3–4 diviso; baccâ ignotâ.

Hab. Ad Santa Cruz floret mens. Nov. (N. 472.)

Fruticulus pusillus nec ultra 26·0 cm. alt., vulgo 12·0–16·0 cm., caulibus nunquam ramosis. Rhizoma usque ad 2·0 cm. diam., in sicco bruneum, inferne radices paucas tenuissimas sparsim ramosas, superne caules stipatos emittens. Caulis strictus, 0·3–0·4 cm. diam., basi sæpe squamas vel folia hebetata (intermedia brevia, plerumque 1·5–3·0 cm. long.) ostendens. Folia modica, 3·5–7·0 cm. long., 2·5–3·5 cm. lat., pergamena, supra viridia nec in sicco nigricantia; costæ secundariæ 8–10, leviter et gradatim arcuatæ, oblique insertæ, subtus prominulæ; petioli nec ultra 0·3 cm. long.; stipulæ 0·4–0·8 cm. long., membranaceæ, extus villosulæ, intus glabræ vel pilosæ, persistentes. Inflorescentia circa 10-flora. Bracteæ circa 0·4 et bracteolæ 0·25–0·3 cm. long., in sicco bruneæ. Ovarium 0·25 cm. long., vix 0·2 cm. diam. Calyx vix 0·4 cm. long.; segmenta 0·22–0·25 cm. long. Corolla alba, 0·9 cm. long.; tubus 0·65–0·7 cm. long., limbi 0·7 cm. diam., lobi 0·2–0·3 cm. long. Discus crateriformis, 0·7 cm. alt. Stamina 0·4 cm. supra basin corollæ inserta; antheræ 0·15 cm. long. Stylus 0·65 cm. long., glaber. Stigmata usque ad 0·15 cm. long.

Nulli nisi *Sipaneæ canæ*, Hook., affinis, sed multis signis ab illâ discrepat, scilicet staturâ humili, indumento, foliis disparibus, corollâ, etc., toto cœlo diversa. [Bras. Or., Goyaz, Peru.]

Hujus forsan varietatem insequentem inveni ad Santa Cruz mens. Dec. florentem, videlicet (n. 794): var. *lanceolata*, quæ a typo divergit ob staturam paullo elatiorem (25·0–30·0 cm. alt.), folia paullo majora supra parce villosulo-pilosa, in sicco nigricantia, stipulas lanceolatas, bracteas exteriores majores (0·6 cm. long.), corollæ tubum longiorem (0·8 cm. long.), stamina sub fauce inserta, antheras paullo longiores, angustiores, apice acuto, necnon stylum breviorem.

This is probably the short-styled form, the other being the long-styled, but the variation in length of the styles and position of insertion of the stamens is accompanied by so much difference in the purely vegetative organs of the plant that this view must remain a mere surmise for the present.

Bertiera guianensis, Aubl. Pl. Guian. p. 180.

Hab. Incolit sylvam primævam inter Santa Cruz et Campos de Tapirapuan, ubi inveni mens. Sept. (N. 372.) [Amazonia, Guiana, Peruvia, Nov. Granat., Ind. Occ.]

Alibertia myrciifolia, K. Schum. in Mart. Fl. Bras. vi. pars vi. p. 393.

Hab. Juxta urbem Cuyabá frequens, necnon ad Serra da Chapada: floret mens. Aug. (Nn. 33, 37, 53, 158.)

Frutex metralis. Flores albi.

There are two forms of this in the collection, one (no. 33, from the Chapada Plateau) has larger leaves and somewhat longer corollas than the other; its branches also are white, those of the other form being purplish. [Bras. Or., Goyaz, Amazonia, Guiana.]

Alibertia amplexicaulis (sp. nov.); ramis erectis, rigidis, complanatis, arcte pubes-

centibus, dein glabris, internodiis sat elongatis; foliis ovatis vel ovato-oblongis, obtusissimis, basi cordatis, amplexicaulibus, rigidissime coriaceis, supra eximie reticulato-nervosis; inflorescentiâ ♂ 4–6-florâ, foliis 2 summis et vaginâ stipulari superposita suffultis; calyce brevi cupulari truncato integro vernicoso, intus crebro glanduloso; corollâ hypocraterimorphâ, calycem circa 8-plo excedente, ad $\frac{1}{4}$ in lacinias breves, deltoideo-ovatas obtusas, extus ut tubus et intus puberulas, diviso, tubo tetragono, vernice copiosa superfuso, intus glabro; staminibus infra medium tubi affixis; antheris anguste fusiformibus; baccâ vix maturâ, magnitudine pisi magni, globosa, levi.

Hab. Crescit in cacumine montium Serra da Chapada, ubi floret et fructificat mens. Aug. (N. 148.)

Frutex, altitudine prætermissa. Rami 0·3–0·5 cm. diam., purpureo-cinerei. Folia usque ad 8·5 cm. long. et 5·7 cm. lat. (mediocria 3·5–5·5 cm. long.), margine revoluta, supra nitida, glaberrima, subtus pallida et obsolete pubescentia; costa media supra maxime eminens, sæpe apicem versus folii dichotoma vel obsoleta; costæ secundariæ utrovis latere 6–8, angulis variis sæpissime latis insertæ, nonnunquam undatæ et mox dichotomæ, paginâ superiore eminentes, inferiore sæpe impressæ, venulæ pag. sup. arcte reticulatæ, pag. inf. obsoletæ; petioli brevissimi (nec ultra 0·1 cm. long.), sæpe omnino obsoleti. Stipulæ brevissimæ rotundatæ, obtusæ, glabræ, longitrorsum rugatæ, 0·15–0·2 cm. long. Calyx masc. circa 0·1 cm. alt. et 0·25 cm. diam. Corolla in toto 0·8 cm. long., tubus superne ampliatus ibique 0·17 cm. diam.; lobi vix 0·2 cm. long. Stamina 0·22 cm. supra basin corollæ tubi inserta. Antheræ 0·5 cm. long. Discus pulvinatus, vernicosus. Bacca 0·8 cm. long., 0·7 cm. diam., calyce 0·075 cm. alt. et 0·2 cm. diam. coronata. Flores fem. non suppetebant.

Species cum *Alibertiâ obtusâ*, K. Schum., comparanda, et facili obtutu notata, inter plura alia, habitu nequaquam toruloso, foliis amplexicaulibus latioribus et maxime coriaceis, itaque stipulis brevibus rotundatis nec acutis. [Bras. Or.]

Alibertia verrucosa (sp. nov.). Rami compressiusculo-subtetragonis, novellis glabris, internodiis sat elongatis; foliis breviter petiolatis, amplis, cuneato-obovatis, sæpissime obtusissimis, interdum breviter cuspidatis, nunc tenuiter coriaceis, subtus in axillis costarum secundariarum breviter barbellatis, ceteroquin glabris; flore femineo solitario, sessili; calyce brevissimo, cupulari, integro; disci ore incrassato, lobulato; baccâ globosâ, verrucis elongatis densissime obtectâ.

Hab. Viget in sylvis ad Santa Cruz, ubi fructus maturos præbet (ut nunciabant incolæ) mens. Dec. Nom. vernac. *Mermelado con spini.* (N. 540.)

Arbuscula ramosa (potius frutex elatus?), altitudine prætermissâ, fortasse circa biorgyalis. Ramuli 0·3–0·4 cm. diam., erecto-ascendentes, ad nodos tumidi, cortice albicante rimoso cincti; intermedii usque 11·0 cm. long., plerumque minores, raro ad 0·5 cm. abbreviati; stipulæ ovatæ, obtusissimæ, 0·25 cm. long., mox deciduæ. Foliorum lamina 11·0–16·0 cm. long., 3·5–9·0 cm. lat. (modica 6·0–7·0 cm.), margine leviter cartilaginea; costæ secundariæ 6–8, distantes, angulo circa 45° raro sub-

opposite insertæ, fere rectæ, juxta marginem subito arcuatæ; petioli 0·5–1·5 cm. long., validi, facie superiori canaliculati. Flores ignoti. Calyx fem. supra fructum 0·1 cm. alt., 0·3 cm. diam. Bacca unilocularis, immatura 2·0 cm. diam., viridis. Semina ignota.

Species insignis, et ob baccas verrucosas omnibus ab aliis hucusque descriptis facile distinguenda.

The warted fruits are so striking a character that I have ventured to describe this plant, although both male and female flowers are unknown. The fruits, which were rapidly increasing in size at the time we had to leave Santa Cruz (the beginning of December), were said by the people of that place to ripen before the end of the year; they are then made into a preserve.

Basanacantha armata, Hook. f. in Gen. Pl. ii. p. 83, var. et typica forma pubiloba.

Hab. Crescit ad Santa Cruz, ubi mens. Nov. floret. (N. 464.) [Amer. Austr. Trop., Paraguaria.]

Tocoyena hirsuta, Moric. DC. Prod. iv. p. 375.

Hab. Reperi florentem ad Jangada mens. Sept. (N. 261.)

Arbuscula 3-metralis, sursum foliata. Corollæ odoratæ tubus pallide viridis, limbus niveus. [Bras. Or., Amazonia, Guiana.]

Randia Ruiziana, DC. Prod. iv. p. 388, var. longiflora, K. Schum.

Hab. In ripâ inveni fl. Brasinho, itaque fl. Paraguay prope Santa Cruz, mens. Oct. florentem. (Nn. 441, 630.)

The ovary of a flower examined by me certainly had parietal placentas, so that, if this be a character of the plant named by De Candolle *Randia Ruiziana*, the latter is not a good *Randia*.

Although included by K. Schumann among the Brazilian Rubiaceæ, there can be but little doubt that this was done without warrant. Spruce's specimens formed part of a collection made upon the Cassiquiari, Vasiva, and Pacimone rivers; the first and last of these are plainly in the Amazonas province of Venezuela, and the Vasiva is probably one of the small neighbouring affluents of the Rio Negro.

From the phytogeographical point of view, this plant, of which I saw plenty, is one of the most interesting in the collection. [Venezuela, Guiana, Nov. Granat., Peruvia, Amer. Centr.]

Guettarda viburnoides, Cham. & Schlecht. in Linnæa, 1829, p. 182, var. α. pannosa, Muell. Arg.

Hab. Viget ad Santa Cruz, mens. Nov. florens. (N. 661.) [Bras. Or., Goyaz.]

Guettarda mattogrossensis (sp. nov.); ramulis patentibus, hinc inde ad spinas validas leviter curvatas per paria dispositas vel ramulis foliigeris oppositis et nunc solitariis reductis; stipulis parvis, ovato-lanceolatis; petiolis mediocribus, paginâ foliorum obovato-oblongâ vel ovato-lanceolatâ, plerumque acutâ vel cuspidato-

acuminatâ, inferne sensim plus minus coarctatâ, costis secundariis utroque latere 7–11 oblique insertis, leviter arcuatis, utrinque sat prominulis; pedunculis folia subæquantibus validiusculis; cymis bis vel ter dichotome divisis; bracteis lineari-lanceolatis vel linearibus, calycem subæquantibus; calycis parte liberâ tubulosâ, ovarium quater æquante, inæqualiter ac prominule 2–3-lobâ, extus sericeo-tomentosâ, intus fere omnino glabrâ; corollâ extus sericeo-tomentosâ, intus secus medium loborum pilosula, ceterum glabrâ, tubo lobis circa 4-plo longiore, pro genere sat crasso; antheris faucem attingentibus 10-plo longioribus quam latis, paullo supra medium fixis; stylo basin versus longiusculo, tractu incrassato glabro excepto, pubescente; stigmate capitato; ovario anguloso, 4–5 loculari; drupâ non visâ.

Hab. Viget ad Santa Cruz, mens. Nov. florescens. (N. 742.)

Frutex circa 2½-metralis, ramis abundans. Ramuli validi, teretes, rufo-tomentosi, deinde glabri. Spinæ 0·4–1·2 cm. long., annulatim notatæ, acuminatæ. Foliorum paginæ pleræque 5·0–10·0 cm. long., 2·5–vix 6·0 cm. lat., basi paullo obliquæ, apice acutæ vel breviter cuspidato-acuminatæ, utrinque secus nervos appresse rufo-tomentellæ, ceterum puberulæ; petioli plerique 0·4–0·9 cm. long., rufo-tomentosi. Stipulæ ad 0·5 cm. long., et circa 0·75 cm. lat. Pedunculi plerumque 4·5–8·0 cm. long., rufo-tomentosi. Cymæ pleræque 10–16-floræ; cymulorum pedicelli communes ad circa 0·5 cm. long., rufo-tomentosi. Bracteæ 0·4–0·6 cm. long., pubescentes. Calycis tubus superus vix 3·0 cm. long., breviter ac irregulariter denticulatus, rufo-tomentosus. Corollæ tubus ad 1·33 cm. long., superne sensim ampliatus, ibique 0·2 cm. lat.; limbus 0·8 cm. diam.; lobi 0·4 cm. long., 0·2 cm. lat.

Species critica; a *Guettardâ Burchellianâ*, Muell. Arg., cui proxima, distat ob nervos secundarios oblique insertos (haud semirectos), petiolos longiores, stipulas diversiformes, corollæ tubum multo breviorem, stylum basi glabrum, etc. *G. Pohliana*, Muell. Arg., petiolis longioribus, stipulis diversiformibus et majoribus, corollâ et stylo disparibus gaudet [Bras. Or., Goyaz.]

CHOMELIA MYRTIFOLIA (sp. nov.). Fruticosa, inermis; ramulis juvenilibus fulvo-hirto-pubescentibus; stipulis triangulari-ovatis, acuminatis; foliis subsessilibus, ovatis, basi brevissime cordatis, supra glabris, subtus, præsertim in nervis, piloso-pubescentibus; costis secundariis utrovis latere 4–5; cymarum pedunculis quam folia brevioribus, plurifloris vel paucifloris; calycis profunde 5-partiti lobis ovario longioribus, inæqualibus, foliaceis oblongis vel oblongo-spathulatis, obtusis, in sinu glanduligeris; corollæ gracilis, extus appresse sericeo-pubescentis, intus glabræ, tubo lobis 5-plo longiore; antheris tubo inclusis, ad ⅓ altitudinis affixis, filamentis brevissimis, 8-plo longioribus quam latis; disco epigyno glabro; stylo elongato, gracillimo, glabro; ovario cylindrico, hirsuto.

Hab. Crescit ad Santa Cruz, ubi floret mens. Dec. (N. 776 *a*.)

Ramuli teretes, demum glabri et cortice albido obtecti. Folia 2·0–3·5 cm. long., 1·3–2·0 cm. lat., coriaceo-membranacea, supra pallidissime nitentia, subtus aliquanto decoloria; petioli 0·1 cm. long., hirto-pubescentes. Stipulæ 0·2 cm. long., appresse hirtulæ. Pedunculi usque ad 1·0 cm. long., superiores vero breviores, graciles,

piloso-hirti. Calycis extus piloso-hirti lobi 0·15 cm. long. Corollæ tubus superne sensim ampliatus, 1·2 cm. long., sub limbo 0·12 cm. lat.; limbi 0·4 cm. diam., lobi 0·25 cm. long. Stamina ad 0·2 cm. infra fauces inserta; antheræ 0·17 cm. long., 0·02 cm. lat. Ovarium sub flore vix 0·1 cm. long. Stylus breviter exsertus, 1·25 cm. long. Stigmatis lobi lineares, abbreviati, 0·06 cm. long. Baccæ ignotæ.

Ex affinitate *Chomeliæ gracilis* (*Anisomeris gracilis*, K. Schum.; Glaziou, n. 19441 in Herb. Kew.), cujus calyx minor et minus foliaceus, stamina breviora tubo inserta, stigmatis lobi abbreviati et lineares nec elongati et spathulati, etc. [Bras. Or.]

The vernacular name of this shrub was given me as *Govinha do Campo*, and it (the berries I presume) was said to be used in flavouring caña. *Myrcia effusa* is called *Govinha*, and I think it quite possible that my informant may have mistaken the *Chomelia* for the *Myrcia*, the former having much the habit of a Myrtacea. Moreover, *Myrcia*-berries are much more likely to be used as a flavouring than those of *Chomelia*. The root of the word is perhaps *gorvo*, the Portuguese for a clove.

CHOMELIA RIBESIOIDES, Benth. ex A. Gray in Proc. Amer. Acad. iv. p. 38.

Hab. Crescit in cacumine montium Serra da Chapada, et floret mens. Aug. (N. 168.)

Frutex circa metralis, copiose ramosus. Flores lutei, foliis quasi umbraculo contra solis injuriam tecti.

Both Mueller Arg. and the authors of the 'Genera Plantarum' agree in describing the flowers as tetramerous, but some of the flowers of my specimens are pentamerous, as is also the case with herbarium specimens examined by me. [Bras. Or., Goyaz, Amazonia.]

CHOMELIA, sp. nov.? Frutex diffusus; ramis rigidis, subteretibus, hâc atque illâc tumidis, 0·3 cm. diam.; ramulis ramis similibus, sed spinescentibus; foliis parvis, brevissime petiolatis, ovatis, obtusis, basi rotundatis vel obtusis, nonnunquam levissime cordatis, coriaceis, subtus in nervis barbellatis, 1·5–3·0 cm. long., 1·0–2·3 cm. lat.; costis secundariis perpaucis, supra impressis, subtus eminentibus; baccâ oblongâ, 0·7 cm. long., 0·2 cm. lat., pilosâ, viva purpureo-nigrâ, calycis reliquiis extus pilosis, recurvis, linearibus, obtusis, 0·2 cm long. coronatâ. Flores non vidi.

Hab. Crescit in sylvestribus ad Santa Cruz, ubi mens. Sept. fructificat. (N. 321.)

CHIOCOCCA BRACHIATA, Ruiz & Pav. Fl. Peruv. ii. p. 67: var. β. *lanceolata*, Muell. Arg.

Hab. Crescit in fruticetis ad Santa Cruz, mens. Nov. florens. (N. 741.) [Amer. Austr. Trop., Ind. Occ.]

COUSSAREA HYDRANGEÆFOLIA, Benth. & Hook. f. Gen. Pl. ii. p. 121.

Hab. Floret ad Santa Cruz mens. Dec. (N. 739.) [Bras. Or., Goyaz.]

COUSSAREA FRONDOSA (sp. nov.); stipulis interpetiolaribus amplis, rotundatis, muticis, crasse coriaceis, deciduis, intus annulo dentium scariosorum subulatorum satis elongatorum auctis; foliis valide petiolatis, amplis, late oblongo-ovatis vel obovato-oblongis, subito longiuscule cuspidatis, basi plus minus attenuatis, interdum cuneatis, coriaceo-membranaceis; costis secundariis 6–8, inferioribus approximatis, oblique insertis, sub margine undulatim-fornicatis, ibique tandem conjunctis; venulis

arcte reticulatis, utrinque (præsertim vero subtus) eminentibus; paniculis terminalibus abbreviatis, sc. quam folia multoties brevioribus, breviter pedunculatis, nonnunquam fere subsessilibus; ramulis conferto-ascendentibus, apice bi-trichotomis, paucifloris; calycis parte liberâ ovarium circa $2\frac{1}{2}$-plo superante tubulosâ, ore breviter 4-dentato, intus glandulis parvis crebris instructo, alabastris anguste claviformibus; corollæ elongatæ obsolete puberulæ lobis lineari-lanceolatis, tubo limbo 3-plo excedente ad $\frac{4}{5}$ altitudinis staminigero; antheris comparatione parvis, 7-plo longioribus quam latis, dorso ad $\frac{1}{3}$ altitudinis fixis; stylo filiformi, glabro; stigmatibus elongatis, stylo plane latioribus.

Hab. Crescit ad Santa Cruz, mens. Nov. florens. (N. 524.)

Arbuscula ramosa, 5-metralis. Ramuli validi, compresso-subtetragoni, grisei, puberuli, longitrorsum striati. Petioli 1·0–2·5 cm. long., patentes, validi, anguste canaliculati, minute pubescentes; foliorum lamina usque ad 25·0 cm. long. et 13·5 cm. lat. (modica 20·0×10·5 cm.), utrinque nitida, subtus vero paullulum decolor, supra, costis minute puberulis exemptis, glabra, subtus, præsertim in nervis, patenti-pubescens. Stipulæ circa 0·5 cm. long., extus puberulæ. Inflorescentia nec ultra 5·0 cm. long. et 4·0 cm. lat., axes obesi, puberuli, grisei; cymulæ satis brevipedunculatæ, pleræque 6–12-floræ. Flores albi, pedicellis obesis ovario æquilongis suffultis. Ovarium 0·1 cm. long., calyce paullo angustius, una cum calyce minutissime pubescens. Calyx 0·25 cm. long., vix 0·2 cm. lat. Corolla tota 3·8 cm. long.; lobi vix 1·0 cm. long., 0·1 cm. lat., apice obtusa; tubus inferne vix 0·1 cm. lat., in faucibus usque ad 0·25 cm. dilatatus, intus puberulus. Stamina 2·3 cm. supra basin corollæ fixa; filamenta glabra, complanata, antheris distincte breviora; antheræ apice acutatæ, vix 0·3 cm. long., 0·04 cm. lat. Stylus circa 1·0 cm. long., deorsum paullo incrassatus. Stigmata 0·65 cm. long. Baccæ non suppetebant.

Coussareæ macrophyllæ, Muell. Arg., proxima, sed foliis angustioribus, costis secundariis paucis, paniculis abbreviatis, corollæ lobis tubo 3-plo brevioribus nec tubum semiæquantibus, antheris multo brevioribus, stigmatibus latis, inter alia, bene distinguenda. *C. Regnelliana*, Muell. Arg., foliis latioribus basi subcaudatis, calyce longe diverso, et antheris duplo longioribus gaudet; itaque stipulæ *C. amplæ* auct. laudati intus haud denticuligeræ, inflorescentia hirto-puberula, ovarium necnon calyx admodum diversus. [Amazonia.]

In hoc genus verisimiliter trahendum est specimen nanum ad Santa Cruz mens. Nov. lectum (n. 546), cujus folia breviter petiolata, membranacea, oblongo-obovata, acuminata, summum minute puberula, 11·0–17·0 cm. long.; inflorescentiæ terminales foliis breviores; cymulæ patentes, paucifloræ; flores ignoti; baccæ ovoideæ, minute puberulæ, 1-spermæ, 0·5 cm. lat., vix 1·0 cm. long.

Faramea (§ Hypochasma ?) coussaroides (sp. nov.); stipulis intrapetiolaribus brevibus, latis, apice obtusis, basi breviter connatis, caducis; foliorum laminâ amplâ e basi rotundata vel obtusa, late elliptica, cuspidato-acuminata, papyracea, supra, præsertim in costis, puberulâ vel minute pubescente, nitidâ, subtus pubescente; costis secundariis circa 8, rarius opposite vel subopposite insertis, ipso sub margine arcuatim junctis, ceteroquin rectis; cymis abbreviatis, plurifloris, pedunculis quam folia multoties bre-

vioribus suffultis; calycis parte liberâ satis elongatâ, anguste tubulosâ, ore brevissime et inæqualiter 4-dentato; alabastris anguste claviformibus; corollæ lobis tubo $2\frac{1}{2}$-plo brevioribus, oblongo-linearibus, obtusis, tubo elongato tenui, sursum leviter ac gradatim amplificato, prope faucem staminigero, obsolete puberulo; antheris breviter exsertis, 10-plo longioribus quam latis, dorso vix ad $\frac{1}{4}$ longitudinis affixis; stigmatibus filiformibus; ovarii dissepimento sursum evanido.

Hab. Floret ad Santa Cruz mens. Dec. (N. 750.)

Arbuscula circa 4-metralis. Ramuli subtetragoni, sæpe geniculati, pubescentes, mox glabri, et cortice leucophæo undato-striato obducti, 0·35–0·6 cm. diam. Stipulæ 0·2 cm. long., firmæ, extus pubescentes, nunc caducissimæ, nunc paulisper persistentes. Foliorum limbus usque ad 18·0 cm. long. et 10·5 cm. lat., in sicco supra nigricans, subtus pallidior; petioli patuli, validi, pubescentes, 1·0–2·0 cm. long. Cymæ 4·0–6·0 cm. long., 4·0–5·0 cm. lat., sat incrassatæ; pedunculus circa 2·0 cm. long., una cum cymæ ramulis pubescens. Flores albi. Ovarium vix 0·15 cm. long., albo-tomentosum. Calycis pars libera circa 0·17 cm. long. et lat., minute pubescens; dentes obtusi, ciliati. Corollæ tubus vix 2·5 cm. long., basi 0·1 cm. lat., sub limbo fere ad 0·2 cm. amplificatus; lobi vix 1·0 cm. long., 0·2 cm. lat. Antheræ 0·45 cm. long., 0·04 cm. lat., apice curvatæ, acutæ. Discus 0·05 cm. alt. Stylus paullo ultra 2·0 cm. attingens, puberulus. Stigmata 0·35 cm. long. Bacca ignota.

Species nulli affinis, sed fortasse juxta *F. coronatam*, Muell. Arg., difficile interponenda. Cum habitu *Coussarearum* præbet attamen placentationem Faramearum.

FARAMEA BRACTEATA, Benth. in Linnæa, xxiii. p. 452.

Hab. Florescit in ripâ fl. Paraguay inter Santa Cruz et Diamantino mens. Oct. (N. 638.)

Involucrum album, flores cyanei. [Goyaz.]

PSYCHOTRIA (§ EUPSYCHOTRIA) OREADUM (sp. nov.); stipulis in vaginam intra- et inter petiolarem brevem, utrinque juxta petiolos subulato-unidentatam connatis; limbo foliorum lanceolato vel ovato-lanceolato acuto, nonnunquam breviter cuspidato; costis secundariis utrinque latere 8–10 aperte arcuatis, ipso sub margine irregulariter junctis; venis late reticulatis; paniculâ terminali modice pedunculatâ, congestim corymbiformi, dense bracteatâ; ramulorum bracteis lanceolatis, puberulis, albidis, flores longitudine excedentibus; calycis parte liberâ ovario paullo breviore, tenuiter cyathiformi, minute ac inordinatim denticulatâ, obscure pilosiusculâ; tubo intus pauci-glanduloso; corollâ aperiente claviformi, apice minute puberulâ, intus medio staminigerâ ibique sparsim pubescente, fauce dense ac minute pubescenti-pulvinatâ; lobis lanceolatis, $\frac{1}{2}$ longitudinis tubi æquantibus; antheris dorso $\frac{1}{3}$ supra basin fixis; disco epigyno, incrassato, urceolari, 10-lobulato; stylo superne ampliato, longe bifido, ramis parum complanatis, integris; baccâ ignotâ.

Hab. Ad Santa Cruz, necnon in ripâ fl. Paraguay inter Santa Cruz et Villa Maria, floret Nov.–Dec. (N. 810.)

Frutex parvus e rhizomate sat crasso, leviter toruloso erectus, crebre ramosus, circa $\frac{2}{3}$-metralis. Caules et ramuli graciles, glabri. Folia 6·0–12·0 cm. long., 2·0–5·5

cm. lat., glabra, membranacea, sicca læte viridia. Petioli brevissimi, nec ultra 0·2 cm. long., interdum obsoleti. Pedunculi 1·5–3·0 cm. long., pubescentes, dein fere glabri. Paniculæ 2·5–3·0 cm. diam., puberulæ vel pubescentes. Bracteæ usque ad 1·3 cm. long. et 0·4 cm. lat., plerumque vero minores, albæ, in sicco stramineæ. Flores albi. Ovarium sub flore 0·06 cm. long. et lat., costulatum, glabrum. Calyx 0·04 cm. long. Corollæ lobi vix 0·2 cm. long., acuti, extus, præsertim apice, pilosuli. Antheræ 0·2 cm. long., 0·04 cm. lat., apice obtusæ, breviter exsertæ. Stylus 0·25-0·25 cm. long., glaber. Stigmata 0·2 cm. long., sursum ampliata, obtusa.

Cum *Psychotriâ lupulinâ*, Benth., et *P. leucophæâ*, Pœpp. et Endl., componenda, ab illâ vero distans bracteis necnon floribus disparibus, ab hâc præter alia stipulis diversis, foliis minoribus nec longe acuminatis, bracteis comparative exiguis, floribus diversiformibus et albis nec violaceis. [Amazonia.]

PSYCHOTRIA OREADUM, var. ? VIRIDIS (nov.).

Cum *P. Oreadum* optime congruens, sed bracteæ latiores, firmiores, virides, nec albi. Flores desunt. Baccæ late depresse ovoideæ, nunc didymæ, nunc integræ, vivæ luride virides. Fruticulus semimetralis.

Hab. Crescit inter Santa Cruz et Villa Maria in ripâ fl. Paraguay. Floret mens. Dec. (N. 838.)

PSYCHOTRIA TRIPHYLLA, Muell. Arg. in Mart. Fl. Bras. vi. pars v. p. 233.

Hab. Frutex altus; viget in sylvâ primævâ inter Santa Cruz et Campos de Tapirapuan, itaque ad Santa Cruz. Floret menss. Sept.–Nov. (Nn. 375, 563.) [Amazonia, Guiana.]

PSYCHOTRIA MARCGRAVII ?, Spreng. Syst. Veg. iv. Cur. Post. p. 79.

Hab. Reperi in sylvâ primævâ inter Santa Cruz et Campos de Tapirapuan mens. Sept. (N. 402.)

Suffrutex metralis. Pedunculus necnon pedicelli rubri, flores violacei.

Owing to the immaturity of the flowers, I find it impossible to name this plant without some doubt as to the identification.

PSYCHOTRIA CUJABENSIS, Schlecht. in Linnæa, xxviii. (1856) p. 507.

Hab. In sylvis juxta fl. Paraguay, inter Santa Cruz et Diamantino, mens. Oct. florens. (N. 618.)

Frutex metralis. Flores albi. [Matto Grosso.]

PSYCHOTRIA SUBCROCEA, Muell. Arg. in Mart. Fl. Bras. vi. pars v. p. 244.

Hab. Crescit juxta Santa Cruz, necnon ad ripas fl. Paraguay inter Santa Cruz et Diamantino, mens. Dec. florens. (Nn. 606, 812.)

Frutex metralis. Pedunculi et pedicelli corallini; flores lutei, nitentes. Specimina mea a typo divergunt foliis longius petiolatis (pet. usque ad 1·0 cm. long.) et corollæ tubo abbreviato, neque ultra 0·9 cm. long.

I have been in much doubt about this identification. The chief points of difference between my specimens and the type are the longish petioles, which in the type are only

0·2–0·3 cm. long, and the smaller corollas, never more than 0·9 cm. long. instead of 1·2–1·3 cm. Since, however, Pohl's no. 845, referred by Mueller Arg. to *Psychotria subcrocea*, has long-petioled leaves, and Blanchet's no. 2699, which Mueller names *P. subcrocea*, var. *confusa*, has short corollas, I have decided to refrain from adding another to the long list of species ranged under this troublesome genus. [Bras. Or., Goyaz.]

PSYCHOTRIA SUBCROCEA, Muell. Arg., var. CONFUSA.

Hab. Fruticem altum, pedicellis rubris et floribus luteis, inveni in ripâ fl. dos Bugres mens. Oct. (N. 434.)

PSYCHOTRIA (§ EUPSYCHOTRIA) HOMOPLASTICA (sp. nov.) (Tab. XXVI.); stipulis magnis, late ovatis, acute bilobis, scarioso-membranaceis, nec vaginantibus; foliorum limbo amplo lanceolato vel obovato-oblongo, breviter cuspidato, membranceo-papyraceo; costis secundariis circa 21–28, sensim arcuatis, sub margine junctis; venis transversis, parum reticulatis, pag. inf. impressis, pag. sup. eminentibus; paniculâ terminali, pedunculatâ, sublaxiuscule compactâ, crebre bracteosâ; bracteis elongatis, oblongo-lanceolatis; calycis parte liberâ tubulosâ, quam ovarium breviore, ore breviter 5-fidâ, intus eglandulosa; corollâ aperiente apice glabrâ, intus, supra medium tubi, juxta fauces staminageras, pubescente, ceterum glabrâ; antheris circa 6-plo longioribus quam latis, dorso mediâ altitudine fixis; stylo filiformi conspicue bifido, ramis complanatis pubescentibus, disco crassiusculo, alte bilobo.

Hab. Crescit in sylvâ primævâ inter Santa Cruz et Campos de Tapirapuan, ubi mens. Sept. floret. (N. 381.)

Frutex usque bimetralis. Ramuli compresso-subtetragoni, læves, sicco virides, nodis leviter tumidis, 0·4 cm. lat.; intermedii plerumque 5·0–12·0 cm. long. Foliorum lamina usque ad 18·0 cm. long. et 6·5 cm. lat. (mediocris 14·0 × 6·0 cm.), basi acuta, margine obsolete undulata, in sicco nigricans, subtus dilutissime virens, glaberrima, juvenilis vero subobsolete puberula; costa media in sicco straminea, subtus eminens. Petioli 1·0 cm. long., patuli, in sicco virides, facie superiori late canaliculati. Stipulæ ± 2·0 cm. long. 1·0–1·5 cm. lat., omnino liberæ, pleræque ad 1·0–1·5 cm. bilobæ, longitrorsum nervosæ, in sicco virides. Pedunculi 4·0–5·0 cm. long., glabri. Inflorescentiæ usque ad 4·5 cm. diam. Bracteæ vix 2·0 cm. attingunt, plerumque circa 1·0–1·5 cm., membranaceæ, obsolete puberulæ. Calycis lobi deltoidei, obtusi vel acuti, vel brevissime cuspidulati, nonnunquam bicuspidulati. Corolla expansa 1·2 cm. long.; tubus 1·0 cm long., basi 0·12 cm. diam., superne gradatim vix ad 0·3 cm. amplificatus; lobi ovato-oblongi, obtusi, 0·35 cm. long. Stamina 0·8 cm. supra basin corollæ tubi affixa, filamenta exserta 0·5 cm. long., complanata; antheræ 0·2 cm. long., apice cuspidulatæ. Discus floris aperientis 0·08 cm. alt. Ovarium 0·1 cm. long., glabrum, longitrorsum rugulatum. Stylus vix 0·6 cm. et stigmata 0·2 cm. long. Bacca ignota. Videtur ad *P. lupulinam*, Benth., accedere, sed certe diversa multis signis, nempe bracteis angustioribus, stipulis et foliis omnino disparibus, etc. A *P.* (§ *Cephaëli*) *stipulosâ*, Muell. Arg., cujus ramos, folia, et stipulas miro modo mentitur, distat inflorescentiâ et bracteis toto cœlo diversis.

I have shown specimens of this species side by side with those of *Psychotria stipulosa* to several of my friends, and all have been struck by the remarkable homoplasy. It has in fact been suggested that the two are really one species, but the inflorescences are so unlike that I cannot think this to be possible. [Amazonia.]

PSYCHOTRIA (§ CEPHAËLIS) SCIAPHILA (sp. nov.); stipulis parvis, utrinque geminis, inferne in vaginam inter- et intrapetiolarem connatis; foliorum subsessilium limbo lanceolato, raro ovato-lanceolato, cuspidato-acuminato, basi paullo coarctato ibique obscure obliquo, membranaceo; costis secundariis utroque latere circa 14, late arcuatis; floribus in capitulum terminale breviter pedunculatum, nonnunquam a foliis summis plus minusve occlusum, digestis; bracteis indivisis, lanceolatis, setoso-pilosis, florum et bracteolis 0; calycis maxime setosæ parte superiori, ovarium pluries æquante, fere usque ad basin 5-partito laciniis setaceis, elongatis, setoso-pilosis; corollæ lobis extus setosis, tubo extus puberulo 4-plo brevioribus, tubo supra medium staminigero et pubescente; antheris circa 5-plo longioribus quam latis, dorso fere medio affixis; styli filiformis ramis brevibus obscure complanatis; baccâ ignotâ.

Hab. Abundat in sylvis juxta ripas fl. Paraguay inter Santa Cruz et Diamantino. Floret Oct. (N. 643.)

Bispithamea, caulis e rhizomate repente pallide bruneo, crassitudine pennæ corvinæ ascendens, tenuis, leviter flexuosus, sursum foliigerus ibique hispido-pilosus, ceterum glaber. Stipularum setacearum hispido-pilosarum 2·5–5·0 cm. long., vagina 0·2 cm. alt. Folia 4·0–vix 9·0 long. 2·0–3, cm. lat., utrinque appresse hispido-pilosa, membranacea. Capitulum basi bracteis circa 7 omnino liberis sessilibus, floribus subæquilongis, involucratum. Calycis laciniæ 0·5 cm. long. Corollæ albæ tubus 0·8 cm. long., sursum ampliatus, basi 0·1, sub faucibus 0·2 cm. diam.; lobi ovati, acuti, 0·2 cm. long. Stamina 0·65 cm. supra basin tubi corollæ inserta; filamenta 0·1 cm. long., filiformia; antheræ 0·17 long.; discus crassus, urceolatus, 5-lobatus.

Habitus *P. trichophoræ*, Muell. Arg., stirpis mihi descriptione solummodo notæ, sed præter alia bracteis florum et bracteolis absentibus ab illâ manifeste recedit. [Goyaz.]

[PSYCHOTRIA IPECACUANHA, Stokes, Bot. Mat. Med. i. p. 365. (*Cephaëlis Ipecacuanha*, A. Rich.)

Hab. Abundat in sylvâ primævâ inter Santa Cruz et Tapirapuan, ubi mens. Sept. florescit.

Dried material of this very important plant is scarce; in fact I do not remember to have seen one really good specimen. This has caused me greatly to regret not having brought specimens home with me. I did not do so, thinking that, on arriving in this country, I should find so well-known a plant plentifully represented in herbaria.]

PSYCHOTRIA TOMENTOSA, Muell. Arg. in Mart. Fl. Bras. vi. pars v. p. 370. (*Cephaëlis tomentosa*, Willd.)

Hab. Crescit in cacumine montium Serra da Chapada prope Santa Anna da Chapada, ubi floret mens. Aug. (N. 91.)

Mueller (*l. c.*) distinguishes under the name of *Psychotria Poeppigiana* a form with

calyx three times as long as the ovary, while the calyx of *P. tomentosa* is said to have a calyx which equals the ovary in length. The calyx of my specimens is about half as long again as the ovary. Strange to say, however, the figure in Mart. Fl. Bras. *l. c.* (t. 57) which purports to be that of *P. Poeppigiana* represents a plant whose calyx is but little, if at all, longer than the ovary. This has caused me much difficulty in naming my specimens. I should suggest the probability of four of Mueller's species, evidently closely allied as they are, being mere varieties of one; these four are *P. Barcellana*, *Poeppigiana*, *tomentosa*, and *Uberabana*. [Brasilia, Guiana, Venezuela.]

Mapouria alba, Muell. Arg. in Mart. Fl. Bras. vi. pars v. p. 393.

Hab. Reperi in ripâ fl. Paraguay, inter Santa Cruz et Diamantino, mens. Oct. florens. (N. 632.)

The stamens of this plant are often inserted at different heights upon the corolla; so, too, are the hairy pads near the points of insertion of the stamens. The figure in Mart. Fl. Bras. (t. 59) is misleading, as it does not show the pads, although Mueller correctly describes them. [Bras. Or., Goyaz, Amazonia, Peruvia.]

Mapouria Martiana, Muell. Arg. in Mart. Fl. Bras. vi. pars v. p. 394.

Hab. Frutex altus, sursum foliatus, crescit in ripâ fl. dos Bugres, ubi mens. Oct. flores albos ostendit. (N. 439.) [Bras. Or., Goyaz.]

Mapouria corumbensis (sp. nov.). Tota glabra, stipulis late ovatis vel rotundatis, obtusis; foliorum limbo lanceolato acuto, nonnunquam leviter cuspidato, basi sensim angustato; costis secundariis utroque latere circa 11, pag. sup. distinctissimis, venulis ultimis reticulum patens constituentibus; paniculis terminalibus breviter pedunculatis, quam folia brevioribus, plus minusve laxiuscule corymbiformibus; bracteis exiguis, triangularibus, obtusis, acutis vel acuminatis; floribus sessilibus; calycis parte superiore quam ovarium paullo breviore eoque latiore, ore breviter 5-dentato, tubo intus haud glandulifero; alabastro obtuso; corollæ lobis tubum subæquantibus, tubo $\frac{1}{3}$-plo longiore quam lato, juxta medium staminigero ibique piloso-hispido; antheris circa 3-plo longioribus quam latis, dorso vix ad $\frac{1}{5}$ longitudinis fixis.

Hab. Viget haud procul a Corumbá, ad ripas fl. Paraguay, mens. Jan. flores præbens. (N. 900.)

Frutex parvus, altitudinis prætermissæ. Caulis ramosus, crassiusculus, sursum in sicco (an etiam vivus?) aliquanto complanatus, nitidus, mox in longitudinem striatus; internodia brevia, 1·0–4·0 cm. long. Folia coriaceo-membranacea, petiolis brevibus obscure alatis 0·5 cm. long. fulta; lamina subtus decolor 3·5–10·0 cm. long. medio 1·5–3·5 cm. lat., ita folia valde inæqualia ac reverâ parva et majora mixta asservare potes; costæ in sicco paullo bruneo-rubræ; margines revolutæ. Paniculæ ad 6·0 cm. long., et deinde totidem diam., complanatæ. Bracteæ circa 0·1 cm. long., ciliolatæ. Flores albi. Calycis pars libera circa 0·05 cm. long. Corolla 0·43 cm. long.; tubus ejus 0·2 cm. long., 0·15 cm. lat.; lobi oblongi, incurvo-acuti. Stamina ad 0·13 cm. supra basin tubi corollæ inserta; antheræ 0·07 cm. long. Ovarium circa 0·08 cm. long. Bacca obovoidea, longitrorsum rugata, 0·6 cm. long., 0·4 cm. lat.

Mihi videtur juxta *Mapouriam Burchellianam*, Muell. Arg., ponenda, sed foliis diversiformibus, inflorescentiâ corymbosâ, necnon punctis aliis ab illa rite secernenda.

The filaments may vary much in length in the same flower, while the anthers fluctuate in correspondence, being sometimes greatly reduced in size. [Bras. Or.]

MAPOURIA TOMENTELLA (sp. nov.); stipulis amplis ovato-oblongis, acutis, membranaceis; foliorum subsessilium laminâ lanceolatâ vel ovato-lanceolatâ, utrinque breviter acuminata, margine repanda, firme membranaceâ, supra fere glabra, subtus, præsertim in nervis, arcte pubescente; costis secundariis utroque latere 10·12 alternatim, rarius subopposite insertis, fere rectis, sub margine subito arcuatim junctis; paniculâ terminali foliis breviore una cum inflorescentiæ ramulis minute tomentellâ; bracteis ovatis, acuminatis, bracteolis minutis; floribus sessilibus; calycis parte liberâ ovario æquilongâ, cyathiformi, breviter 5-lobâ; corollæ parvæ tubo lobos subæquante, tubo paullo infra medium staminigero ibique dense villoso, ceteroquin minute pubescente; antheris 3-plo longioribus quam latis, dorso, paullo supra basin, filamento insidentibus; stylo obsolete puberulo; baccâ ignotâ.

Hab. Viget ad Santa Cruz, mens. Dec. florens. (N. 791.)

Fruticulus $\frac{2}{3}$-metralis. Ramuli subteretes, arcte tomentelli, mox glabri, et cortice cinereo-striato obducti. Folia 8·0–12·0 cm. long., 3·0–4·0 cm. lat., in sicco nigricantia, petioli modo 0·1–0·2 cm. long., tomentelli. Stipulæ usque 0·7 cm. long. et 0·4 cm. lat., omnino liberæ, puberulæ, longitrorsum nervosæ. Pedunculus 4·5 cm. long., 0·1 cm. diam. Inflorescentia circa 3·0 cm. long. et 4·0 cm. diam., e cymulis pluribus parvis-patulo pedicellatis congestifloris constituta. Bracteæ 0·3 cm. long., extus minute pubescentes. Flores virescentes. Calycis pars libera ampla, 0·7 cm. long., pubescens. Corollæ tubus 0·2 cm. long., lobi lanceolato-triangulares, acuti, extus tomentelli. Stamina exserta, vix 0·1 cm. supra basin tubi corollæ fixa; filamenta vix 0·2 cm. long.; antheræ 0·1 cm. long. Discus pulvinatus, 0·08 cm. diam. Ovarium 0·7 cm. long., tomentellum

Affinis *M. luridæ*, Muell. Arg., mihi modo descriptione cognitæ, et facile dignoscenda ex indumento, stipulis haud acute acuminatis, calycis forma, corollâ extus tomentellâ, ejus tubo juxta medium staminigero, ore haud villoso, etc. Ob indumentum propius ad *M. puberulinam* fere accedere videtur, cujus stipulæ rotundato-obtusæ, corollæ tubus ore staminigerus ibique niveo-villosus, antheræ comparative breviores et stylus glaber. [Bras. Or.]

RUDGEA VIBURNOIDES, Benth., in Linnæa. xxiii. (1850) p. 458.

Hab. Crescit ad Santa Cruz, menss. Oct.–Nov. florens. (Nn. 551, 646.)

Frutex ramosus, sursum foliigerus. Flores albi vel dilute lutei, odorati. [Bras. Or., Goyaz.]

RUDGEA FRONDOSA (sp. nov.); ramulis subtetragonis, nodis tumidis, stipulis vaginanti-connatis, rigidis, basi diu persistentibus, dorso sub apice crebro aculioligeris; foliis majusculis brevipetiolatis, ovato-oblongis vel oblongo-obovatis, utrinque obtusis, apice breviter cuspidatis, basi nonnunquam cuneatis, coriaceis, glabris; costis

secundariis circa 8, distantibus angulis latis et sæpe opposite vel subopposite insertis, aperte arcuatis, ipso sub margine undulato-arcuatim junctis ; pedunculo foliis adultis multo breviore, ejus ramulis solitariis vel bi-ternatis, plerisque di-trichotomis, ramulis ultimis sæpissime trifloris ; bracteis exiguis, latis, acutis ; calycis parte superâ quam ovarium circa ter breviore, breviter cyathiformi, intus eglandulosâ, ore breviter 5-lobâ ; alabastris late obovoideis, corollâ circa usque ad medium 5-fidâ, extus puberulâ, intus infra medium tubi staminigerâ ibique dense albo-villosâ, tubi dimidio superiore villoso, inferiore glabro, lobis oblongis, obtusis, apice inflexis ; antheris fere 5-plo longioribus quam latis, dorso ad $\frac{1}{3}$ longitudinis fixis ; disco calycis parti liberæ æquialto pulvinante ; stylo corollæ tubum subæquante, gracili.

Hab. Incolit ripas fl. Paraguay, inter Santa Cruz et Diamantino, mens. Oct. florens. (N. 617.)

Suffrutex semimetralis, ramulis satis obesis, glabris, in sicco stramineis, ad 0·3 cm. diam. Folia usque ad 22·0 cm. long. et vix 11·0 cm. lat. (mediocria 16·0 × 8·0 cm.), in sicco, præcipue subtus, lutescenti-viridia, margine paullo cartilaginea, obsolete undulata, supra nitida ; petioli 0·7–1·7 cm. long., validi, patuli, glabri, alte canaliculati, in sicco sæpe transversim rugati ; stipulæ 0·25 cm. alt. Pedunculi 3·0 cm. long., 0·1 cm. crass. ; panicula circa 5·0 cm. diam. Bracteæ vix 0·1 cm. long., apice sæpe minute ciliolatæ. Paniculæ ramuli patentes vel ascendentes, usque ad 1·5 cm. long., subobsolete puberuli, in sicco longitrorsum striatuli, superne gradatim amplificati. Flores albi. Calyx cum ovario fere 0·2 cm. long. Calyx extus 0·5 cm. alt. ; lobi deltoidei, obtusi, puberuli. Corolla aperta vix 0·7 cm. long. Stamina 0·1 cm. supra basin tubi corollæ fixa, exserta ; filamenta vix 0·35 cm. long. ; antheræ vix 0·2 cm. long. Discus 0·5 cm. alt. Ovarium cylindraceum, longitrorsum rugatum, obscure puberulum. Stylus vix 0·3 cm. long., superne paullo incrassatus ; stigmata 0·1 cm. long.

Forsan *Rudgeæ palicourioidi*, Muell. Arg. (?), affinis, cujus folia minora, inflorescentia longius pedunculata, flores minores, calycis pars libera ovarium late obovoideum semiæquans, corollæ extus glabræ lobi ovato-lanceolati, tubus medio staminigerus, etc. [Bras. Or.]

Rudgea, sp. nov. Glabra, stipulis cuspidato-acuminatis, obscure aculeoligeris, 0·5 cm. long. ; foliis in eodem ramulo breviter petiolatis vel subsessilibus vel arcte amplexicaulibus, lanceolatis vel ovato-lanceolatis, basi coarctatis vel, si amplexicaulibus, obscure cordatis, apice cuspidatis, 8·0–12·0 cm. long., 1·8–4·5 cm. lat. ; paniculis terminalibus, subcorymbiformibus, quam folia brevioribus ; cymulis trifloris ; bracteis exiguis, subulatis, acuminatis ; ovario ovoideo ; calycis parte liberâ urceolatâ, brevissime 5-dentatâ, eglandulosâ ; alabastris acutis ; corollæ cyaneæ nondum apertæ lobis fortasse tubum æquantibus, tubo juxta basin staminigero ; stylo sursum incrassato ; baccis haud visis.

Hab. Suffrutex parvus, semimetralis ; viget in sylvis juxta ripam fl. Paraguay, inter Santa Cruz et Villa Maria, flores mens. Dec. præbens. (N. 811.)

Nisi fallor, rationem iniens de longitudine comparativâ corollæ tubi et loborum, stirps nostra cum *Rudgeá micranthá*, Muell. Arg., conferri debet, sed aliquot ob notas ab illâ abhorret.

In the absence of fully expanded flowers I have thought it better to refrain from giving this plant a specific name.

DIODIA SAPONARIOIDES, Presl, Bot. Bemerk. p. 87.

Hab. Floret ad Santa Cruz mens. Nov. (N. 548.) [Bras. Or., Amazonia.]

DIODIA MULTIFLORA, DC. Prod. iv. p. 564.

Hab. Herbam erectam, floribus albis, inveni prope rivulum ad Santa Cruz mens. Dec. (N. 729.) [Bras. Or.]

BORRERIA LAGURUS (sp. nov.). Herba humilis, 16·0 cm. alt., caule ascendente, subsimplici, herbaceo, tetraquetro, angulis acutis villosulis; foliis anguste lineari-lanceolatis, villosulo-pilosis, margine antrorsum serrulato-ciliolatis, apice breviter apiculatis, vaginâ stipulari abbreviatâ, apice setis circa 8 elongatis, deorsum piloso-ciliatis, longitudine diversis coronatâ; inflorescentiis terminalibus vel axillaribus, confertis; ovario brevissime pedicellato, cylindraceo, piloso; calycis lobis 4 ovario longioribus, subæqualibus, triangulari-lanceolatis, acutis, ciliatis, imâ basi connatis; corollâ calycem paullo excedente, ultra medium in lacinias oblongo-lineares, obtusas, utrinque villosulas divisâ, tubo fere glabro; staminibus imæ basi corollæ tubi affixis; antheris tubo multo brevioribus, $\frac{1}{2}$-plo longioribus quam latis; disci ore integro; stylo brevissimo, disco incluso; stigmate didymo; capsulâ subcylindraceâ, pilosulâ, membranaceâ; seminibus anguste ellipticis testâ fusco-bruneâ, nitidâ, minutissime scrobiculatâ obtectis.

Hab. Crescit ad Santa Cruz, ubi floret mens. Nov. (N. 668.)

Caulis e radice fibrosa circa 0·15 cm. diam., demum glaber; internodia usque ad 4·0 cm. long. Folia pleraque circa 2·0 cm. long. et 0·5 cm. lat., rigida, trinervia, præsertim in nervis paginæ inferioris pilifera; vaginæ stipularis circa 0·1 cm. alt. dentes usque 0·25 cm. long., basi ampliores. Capitula circa 0·7 cm. diam. Flores albi. Calyx cum ovario vix 0·4 cm. attingens; calycis pars libera 0·25 cm. long., lobi erecti marginibus scariosis. Corolla 0·3 cm. long.; tubus 0·12 cm. long., intus superne villosulus, inferne glaber. Stamina 0·02 cm. supra basin tubi corollæ inserta; antheræ circa 0·03 cm. long., obtusissimæ. Discus circa 0·02 cm. alt. Capsula 0·2 cm. long., 0·15 cm. lat. paullulum didyma. Semina 0·18 cm. long., 0·7 cm. lat., ventre sulcata.

Proxima *B. tenui*, DC., cujus indumentum diversum, folia omnino disparia, stipulæ setis 1–3 instructæ, inflorescentia terminalis, calycis lobi subulati, corolla ob plura signa diversa, stylus discum superans, stigma capitatum necnon capsula globosa minor, et semina modo 0·05 cm. long. [Bras. Or., Goyaz.]

BORRERIA CUPULARIS, DC. Prod. iv. p. 543.

Hab. In ripâ fl. Paraguay, juxta Santa Cruz, floret menss. Sept.–Dec. (Nn. 324, 632 *a.*)

Herba $\frac{2}{3}$-metralis. Flores albi vel pallide lavandulacei. [Bras. Or., Goyaz.]

RICHARDSONIA PILOSA, H. B. K. Nov. Gen. et Sp. iii. p. 350. (*Richardia scabra*, Linn.)

Hab. Santa Cruz, mens. Nov. florens. (N. 672.)

Ab incolis *Ortelan* nuncupatur. [Amer. Trop.]

RICHARDSONIA GRANDIFLORA, Cham. & Schlecht. in Linnæa, iii. (1828) p. 351.

Hab. Inveni ad Santa Cruz. (N. 542 *a.*) [Bras. Or., Goyaz.]

COMPOSITÆ.

PACOURINA EDULIS, Aubl. Pl. Guian. p. 800.

Hab. Crescit in paludosis juxta Corumbá, mens. Jan. florens. (N. 912.)

Herba lepida, usque $\frac{2}{3}$-metralis. Flosculi purpurei. Involucri bracteæ late albo-marginatæ. [Amazonia, Guiana, Columbia, Paraguaria.]

VERNONIA DESERTORUM, Mart. in DC. Prod. iv. p. 43.

Hab. Inter Cuyabá et Serra da Chapada floret mens. Aug. (N. 65.) [Bras. Or. Goyaz.]

VERNONIA REMOTIFLORA, Rich. in Act. Soc. Hist. Nat. Par. 1792, p. 117, var. TRICHOLEPIS, Baker. (*V. tricholepis*, DC.)

Hab. Viget ad Coimbrá, mens. Feb. florens. (N. 1071.) [Bras. Or., Goyaz, Amazonia, Guiana.]

VERNONIA RUBRICAULIS, Humb. & Bonpl. Pl. Æquin. ii. p. 66.

Hab. Inveni in ripâ fl. Paraguay prope Corumbá mens. Dec., et ad Puerto Pacheco mens. Feb. florentem. (Nn. 1017, 1064.) [Bras. Or., Uruguaria, Argentina, Columbia.]

VERNONIA OBOVATA, Less. in Linnæa, iv. (1829) p. 279.

Hab. Crescit in graminosis inter Cuyabá et Serra da Chapada, mens. Aug. florens. (N. 62.) [Bras. Or., Goyaz, Bolivia.]

VERNONIA SCABRA, Pers. Syn. ii. p. 404.

Hab. Reperi inter Cuyabá et Serra da Chapada florentem mens. Aug. (N. 50.)

Forma foliis oblongis vel oblongo-obovatis, basi cuneatis, margine serrulatis (4·0–5·0 cm. long., 1·5–2·0 cm. lat.), capitulis parvis. [Amer. Austr. Trop.]

VERNONIA SCABRA, Pers., var. ACUMINATA, S. Moore; foliis serrulatis, acuminatis, usque ad 10·0 cm. long.

Hab. Crescit in angustiis itaque in cacumine montium Serra da Chapada, necnon ad Jangada, menss. Aug. et Sept. florens. (Nn. 119, 167, 265.)

VERNONIA FERRUGINEA, Less. in Linnæa, iv. 1829, p. 271.

Hab. Incolit angustias ad Serra da Chapada, ubi flores præbet mens. Aug. (N. 72.) Suffrutex metralis, deorsum aphyllus, sparsim ramosus.

VERNONIA FERRUGINEA, Less., var. PLATYCEPHALA, Baker.

Hab. Matto Grosso (*Leeson*, in Herb. Mus. Brit.). [Bras. Or., Amazonia, Bolivia.]

STILPNOPAPPUS VIRIDIS, Benth. ex Baker in Mart. Fl. Bras. vi. pars ii. p. 137.

Hab. Floret ad Santa Cruz mens. Oct. (N. 478.)

Capitula pallide purpurea. [Amazonia, Guiana.]

ELEPHANTOPUS SCABER, Linn. Sp. Pl. ed. I. p. 814.

Hab. Mens. Aug. reperi ad Serra da Chapada. (N. 111.) [In tropicis late diffusus.]

ELEPHANTOPUS ANGUSTIFOLIUS, Sw. Prod. Fl. Ind. Occ. p. 115.

Hab. Ad Santa Cruz floret mens. Nov. (N. 598.) [Amer. Trop., Ind. Occ.]

AGERATUM CONYZOIDES, Linn. Sp. Pl. ed. I. p. 893.

Hab. Reperi ad Serra da Chapada. (No. 84.) [Late diffusum.]

EUPATORIUM SQUALIDUM, DC. Prod. v. p. 142.

Hab. Floret ad Cuyabá mens. Aug. (N. 28.) [Amer. Austr. Trop.]

EUPATORIUM VITALBÆ, DC. Prod. v. p. 163.

Hab. In sylva primæva inter Santa Cruz et Tapirapuan floret mens. Sept. (N. 394.) [Amer. Trop.]

EUPATORIUM DENTATUM, Gardn. in Hook. Lond. Journ. vi. p. 443.

Hab. Matto Grosso (*Leeson*, in Herb. Mus. Brit.). [Bras. Or., Goyaz.]

EUPATORIUM (§ HETEROLEPIS) CUJABENSE (sp. nov.); caule erecto, ramoso, obscure tetragono, hispido-pubescente, deinde glabro; foliis coriaceis, sessilibus vel brevissime petiolatis, lanceolatis, obtusis, inferne sensim longe attenuatis, margine revolutis, hinc atque illinc denticulatis, scaberrimis, subtus, præsertim in nervo mediano, hispidis, utrinque eminenter reticulato-nervosis, nitidis; capitulis mediocribus circa 17-floris subcorymbosis, pedicellis hispido-pubescentibus fultis; involucri campanulati bracteis circa 25, exterioribus oblongis, interioribus linearibus, obtusiusculis vel acutis, 3–4 seriatis, dorso hispidulo-pubescentibus; receptaculo plano, nudo; pappi setis circa 20, albidis, rectis.

Hab. In graminosis inveni juxta Cuyabá mens. Aug. florentem. (N. 34.)

Rami brunei, ætate in longitudinem sulcati. Foliorum juga plerumque parum inæqualia, lamina 4·5–7·5 cm. long., medio 1·3–2·0 cm. lat., ima basi usque 0·2–0·3 cm. coarctata; costæ secundariæ 4–6, adjectis pluribus tertii ordinis, mox dichotomis et

arcuatim junctis, venulis laxe reticulatis; petioli nec ultra 0·1 cm. long., hispidulo-pubescentes. Inflorescentiæ usque ad 6·0 cm. long. Pedunculi 3·0 cm. attingentes, tenues, hispidulo-pubescentes. Bracteæ inflorescentiarum lineares vel lineari-oblongæ, inferiores 0·3–0·6 cm. long., superiores sæpe usque ad 0·2 cm. imminutæ. Capitula 0·5 cm. diam. Involucri bracteæ extimæ 0·2 cm. long., 0·08–0·1 cm. lat.; mediæ circa 0·4 cm. long.; intimæ 0·1 cm. long. et 0·03 cm. lat., hæc (sc. intimæ) deorsum glabræ, omnes plerumque longitrorsum 3-nerves, raro 1- vel 2-nerves, in sicco plus minus rubescentes. Receptaculum vix 0·1 cm. diam. Corolla 0·55 cm. long., purpurea. Styli rami attenuati, vix ad 0·15 cm. exserti. Achænia angustissime linearia, 0·2 cm. long., appresse pilosula, pappo debili albido circa 0·4 cm. long. coronata.

Species verisimiliter juxta *Eupatorium serrulatum*, DC., intercalanda, cujus folia attamen disparia, et capitula majora, et involucri bracteæ latiores, et achænia longe diversa, sc. longiora et latiora, et complanata et glabra, necnon pappi setæ paucæ. [Bras. Or.]

EUPATORIUM MEGAPHYLLUM, Baker in Mart. Fl. Bras. vi. pars ii. p. 322.

Hab. In angustiis reperi ad Serra da Chapada circa 300 met. supra mare, mens. Aug. florentem. (N. 170.)

Caulis ascendens, bimetralis, e basi foliigerus; folia inferiora maxima (usque ad 30·0 cm. long.). Capitula alba. [Bras. Or.]

EUPATORIUM KLEINIOIDES, H.B.K. Nov. Gen. et Sp. iv. p. 120.

Hujus reperi varietates duas insequentes, nempe:—

(*a*). Forma exigua monocephala, nec ultra 25·0 cm. alt., foliis pluribus sparsis, ambitum inter Cuyabá et Serra da Chapada habitans, ubi mens. Aug. floret. (N. 48.)

(*b*). Forma usque 30·0 cm. alt., monocephala vel dicephala, foliis rosulatis vel juxta basin caulis confertis, capitulis quam in forma (*a*) aliquanto minoribus, quæ eodem loco in graminosis viget. (N. 49.) [Bras. Or., Goyaz, Peruvia, Columbia.]

EUPATORIUM CONYZOIDES, Vahl, Symb. iii. p. 96.

Hab. Matto Grosso (*Leeson*, in Herb. Mus. Brit.). [Amer. Trop. et Subtrop.]

MIKANIA OFFICINALIS, Mart. in Isis, 1824, p. 587.

Hab. Crescit ad Santa Cruz, ubi flores albos præbet mens. Nov. (N. 583.) [Bras. Or., Goyaz.]

MIKANIA CORDIFOLIA, Willd. Sp. Pl. iii. p. 1746.

Hab. Matto Grosso (*Leeson*, in Herb. Mus. Brit.) [Amer. Trop. et Subtrop.]

EGLETES VISCOSA, Less. Syn. Comp. p. 252.

Hab. In ripis fluvii prope Santa Cruz mens. Oct. floret. (N. 477.) [Amer. Trop. Austr.]

CONYZA CAPILLIPES (sp. nov.). Erecta, caule subtereti, piloso-hispidulo; foliis sessilibus, anguste linearibus, obtusis vel acutiusculis, appresse puberulis; capitulis parvis, apicem versus ramulorum parum confertis, subracemiformi-paniculatis, pedicellis tenuibus insidentibus; involucri campanulati bracteis anguste linearibus, acutis; floribus centralibus hermaphroditis paucis, pappo stramineo.

Hab. Crescit in ripis fl. Paraguay inter Santa Cruz et Villa Maria, mens. Dec. florens. (N. 827.)

Herba elata, ultrametralis. Caulis 0·3 cm. diam., striatus, deinde subglaber. Folia pleraque 1·5–2·0 cm. long., modo 0·1–0·2 cm. lat., membranacea, ascendentia, 1-nervia. Inflorescentiæ 4·0–10·0 cm. long., usque ad 3·0 cm. diam.; earum bracteæ foliis similes nisi minores. Capitulorum pedicelli usque 1·0 cm. long., ascendentes vel patuli, piloso-pubescentes. Capitula demum 0·7 cm. diam. Involucri bracteæ 3-seriatæ, exteriores 0·15 cm. long., interiores 0·4 cm. attingentes; omnes bruneæ, breviter piloso-pubescentes, intimæ fere glabræ. Flores hermaphroditi centrales circa 9, pappum subæquantes. Corollæ limbi lobi lanceolati, acuti. Achænia linearia, complanata, puberula, 0·1 cm. long., pappo stramineo e setis ipsa quater long. æquantibus constituto coronata.

Sine dubio cum *C. triplinervia*, Less., componenda, cujus capitula sat paria, sed folia omnino diversa, et inflorescentia, e capitulis confertis constituta, corymbiformis nec subracemiformi-paniculata. Itaque ejus involucri bracteæ glabræ, flores hermaphroditi centrales modo 3–6, etc. [Bras. Or.]

BACCHARIS SERRULATA, Pers. Syn. ii. p. 423.

Hab. Crescit juxta Corumbá, mens. Jan. florens. (N. 1004.) [Bras. Or., Uruguaria, Argentina, Chili.]

BACCHARIS TRIDENTATA, Vahl, Symb. iii. p. 98.

Hab. Ad Santa Cruz, mens. Oct. florens. (N. 409.) [Bras. Or., Paraguaria.]

ICHTHYOTHERE OVATA (sp. nov.); caulis humilis e rhizomate crasso ascendente simplici vel parce ramoso, hispido-pubescente, mox piloso; foliis parvis sessilibus, brevissime amplexicaulibus, obovatis vel oblongo-obovatis, obtusis, basi 5-nervibus, utrinque breviter hispidulo-puberulis; capitulis paucis, plerumque 2–3 ad apicem caulis confertis, nunc solitariis; involucri bracteis extimis dorso hispidulo-scabridis, interioribus fere glabris; receptaculi paleis oblongis vel lanceolato-oblongis, obtusis, superne eroso-ciliatis.

Hab. Crescit in cacumine montium Serra da Chapada, ubi mens. Aug. florescit. (N. 192.)

Herba perennis, nec ultra 19·0 cm. alt. Rhizoma 0·6–0·8 cm. diam., in sicco bruneum. Caulis sæpe plus minus stipati, saltem basi quadrangularis, plane striati, 0·2 cm. diam.; nodi inferiores squamis membranaceis parvis vaginanti-connatis, longitrorsum nervosis, sursum gradatim in folia transeuntibus ornati. Folia nunquam 2·5 cm. long. excedentia, pleraque circa 1·5 cm., 0·8–1·5 cm. lat., firme membranacea; costæ

laterales subobsoletæ; costæ intermediæ latæ mox dichotomæ, costæ centrali parallelæ. Capitula brevissime pedicellata, foliis floralibus folia vegetativa subæquantibus suffulta, quodvis circa 0·6 cm. diam. Involucri globosi bracteæ exteriores late ovatæ, 0·6 cm. long., 0·4 cm. lat., longitrorsum nervosæ. Receptaculum anguste oblongum, sursum paullulum coarctatum, vix 0·5 cm. alt., 0·08 cm. diam. Paleæ 0·3–0·4 cm. long., plane 1–3-nerves, deorsum marginibus calvis. Corollæ albidæ, 0·25 cm. long., sursum pilis minutis glandulosis instructæ. Stylus hirsutus.

Non dubito quin ad *Ichthyotheren integrifoliam*, Baker, spectet, certe dispar attamen primo obtutu foliis exiguis ovatis. Accedit quod, inter alia, planta nostra corollæ forma et indumento diverso et stylo hirsuto nec mere glanduloso gaudet. [Bras. Or.]

ACANTHOSPERMUM XANTHOIDES, DC. Prod. v. p. 521.

Hab. Ad Santa Cruz menss. Nov.–Dec. floret. (N. 761.) [America, a Florida usque ad Uruguariam et Argentinam.)

ECLIPTA ALBA, Hassk. Pl. Jav. Rar. p. 528.

Hab. Ad Santa Cruz floret mens. Sept. (N. 329.) [In regg. calid. late disseminata.]

WULFFIA STENOGLOSSA, DC. Prod. v. p. 563.

Hab. Reperi inter Villa Maria et Corumbá mens. Dec. vigentem. (N. 1011 *a*.) [Amer. Austr., Ind. Occ.]

Huc non sine dubio refero specimen miserum (N. 1074) ad Coimbrá mens. Feb. lectum, foliis parvis, subtus hirsutulo-pubescentibus, et involucri phyllis quam in typo majoribus.

SPILANTHES URENS, Jacq. Sel. Stirp. Amer. p. 214.

Hab. Reperi inter Cuyabá et Serra da Chapada, necnon ad Santa Cruz. (Nn. 45, 670.) [Amer. Trop.]

TRICHOSPIRA MENTHOIDES, H. B. K. Nov. Gen. et Sp. iv. p. 27.

Hab. Crescit ad Santa Cruz, necnon in ripa fl. Brasinho, menss. Oct.–Dec. florens. (Nn. 429, 503, 798.) [Bras. Or., Goyaz, Amazonia, Guiana, Venezuela, Chili.]

BIDENS BIPINNATA, Linn. Sp. Pl. ed. I. p. 832.

Hab. Ad Santa Cruz floret mens. Nov. (N. 581.) [Late diffusa.]

POROPHYLLUM RUDERALE, Cass. in Dict. Sc. Nat. xliii. p. 56.

Hab. In ripâ fl. Paraguay juxta Corumbá florebat mens. Dec. (N. 999 *a*.) [Amer. Trop. et Subtrop.]

POROPHYLLUM LINEARE, DC. Prod. v. p. 649.

Hab. Crescit ad Coimbrá et ad Puerto Pacheco, ubi mens. Feb. flores præbuit. (Nn. 1059, 1063 *a*.) [Bras. Or., Goyaz, Paraguaria, Argentina, Uruguaria.]

Pectis (§ Pectidopsis) jangadensis (sp. nov.). Pusilla, annua, caulibus brevibus, crebre ramosis, tenuibus; foliis sparsis, nequaquam rosulatis, anguste linearibus; capitulis parvis, longipedunculatis; pedunculis squamis parvis distantibus munitis, circa 10-floris; involucri campanulati bracteis 4–5, disco brevioribus; pappi setis 2 vel 0, squamellis minutis intermixtis.

Hab. Crescit in loco arenoso tempore pluviorum inundato ad Jangada, ubi mens. Sept. floret. (N. 256.)

Herba diffusa nec ultra 8·0 cm. alt., ramulis crebris, patulis, foliatis. Radix tenuiter fibrosa, sparsissime radicellifera, saltem in sicco undulata. Caulis nec ultra 0·05 cm. diam., tetragonus, purpureus. Folia usque ad 1·0 cm. long., plerumque 0·5–0·7 cm., raro vix usque ad 0·2 cm. lat., plerumque circa 0·1 cm., acuta, juxta margines glandulosa, deorsum setoso-ciliata, firma. Pedunculi gracillimi, usque ad 3·0 cm. long., plerique 1·5–2·0 cm., squamæ eorum 1–3, lanceolatæ vel subulatæ, acuminatæ, nec ultra 0·07 cm. attingentes. Capitula 0·3 cm. diam. Involucri bracteæ lanceolato-oblongæ, acutæ, dorso carinatæ, obsolete glandulosæ, 0·4 cm. long., 0·1 cm. lat. Ligulæ circa 5, vix 0·3 cm. long., supra luteæ, dorso rubræ. Disci corollæ 0·15 cm. long.; ejus lobi deltoidei, obtusissimi. Achænia angustissime linearia, sursum paullulum et sensim ampliata, leviter compressiuscula, longitrorsum costulata, puberula, atrata, 0·25 cm. long. Pappi setæ debiles, paullo divergentes, scabriusculæ, 0·15 cm. long.

Planta cum nullâ Brasiliensi hucusque cognitâ conferenda, nobis videtur ad *P. filipedem*, A. Gray, stirpem Mexicanam, spectare, sed certe haud conspecifica ob corollæ minoris inapertæ non acutæ lobos altius connatos, et præsertim, inter alia, achænia et pappum longe diversum. A *P. jaliscana*, Hook. et Arn., etiam Reipublicæ Mexicanæ incola, distat, præter alia, statura humiliori, involucri bracteis obsolete nec conspicue glandulosis, corollæ lobis comparate latis et obtusissimis, achænio longiore ac crassiore pappo paullo breviore coronato. [Mexico.]

Up till now no *Pectis* belonging to the section *Pectidopsis* has been reported from Brazil. These little plants are very liable to be overlooked owing to their small size, and I should not have secured my specimens but for the chance of being attracted to the abundant but lowly vegetation growing at one particular spot close to Jangada village. The same spot yielded *Oxypetalum clavigerum* and *Asclepias jangadensis*, both new species.

Chuquiraga chapadensis (sp. nov.); caule erecto, ramulis ascendentibus, basi interdum breviter bispinosis, ramoso, subtereti, glabro, irregulariter striato; foliis sessilibus, ovato-oblongis ovatisve, acutis vel obtusis, raro obtusissimis, basi obtusis, 5-nervibus, coriaceis, utrinque appresse pilosis vel omnino glabris; capitulis majusculis, paucis, confertis vel subconfertis, sessilibus vel breviter pedunculatis, circa 50-floris; involucri campanulati bracteis extimis late ovatis, obtusissimis, bruneis, nitentibus, glabris vel puberulis, erosis, ciliolatis; pappi setis quam achænia fere 3-plo longioribus.

Hab. Crescit ad Serra da Chapada alt. 600 met. supra mare, mens. Aug. florens. (N. 166.)

Fruticulus robustus, ⅔-metralis. Ramuli subteretes, cortice cinereo, crebre lenticelligero, mox obducti, usque ad 0·5 cm. diam. Spinæ axillares pleræque 0·4–0·6 cm. long., acuminatæ, plerumque rectæ. Folia pleraque 5·5–7·0 cm. long, 2·5–3·0 cm. lat.; costæ exteriores tenues; venulæ laxe reticulatæ, utrinque eminentes. Pedunculi ad 1·5 cm. long., glabri. Capitula vix 2·5 cm. long. et 2·0 cm. diam. Involucri bracteæ pluriseriatæ, extimæ 0·4 cm. long.; mediæ 1·0 cm. long. et 0·6 cm. lat.; intimæ usque 2·5 cm. elongatæ et modo 0·25 cm. lat. et revera hæ dorso lanatæ, omnes intus glabræ, politæ. Corolla alba, paullo ultra 2·0 cm. long., ejus tubus glaber, tenuis, et limbi lobi apice villosi. Achænia 0·6 cm. long., appresse albo-villosa. Pappi 1·7 cm. long. setæ sordide albidæ, plumosæ.

Chuquiragæ Sprengelianæ, Baker, et *C. Donianæ*, Baker, proxima. Illa vero bracteis involucri minoribus et acutis necnon pappo comparate breviore gaudet; hujus bracteæ involucri ut in *C. Sprengelianâ*, et pappus elongatus achænium 4-plo excedit. [Bras. Or.]

Chuquiraga retinens (sp. nov.); caule tereti, molliter tomentoso, hinc atque illinc spinis breviusculis recurvis basi tomentosis munito; foliis brevipetiolatis, oblongo-ovatis, acutis, nec spinoso-mucronatis, basin versus coarctatis, trinervibus, tenuiter coriaceis, supra longe et appresse pilosis, fere villosulis, subtus molliter tomentosis; capitulis parvis pluribus confertis vel subconfertis, pedunculis et pedicellis velutinis incidentibus circa 15-floris; involucri infundibularis bracteis lanceolatis, extimis apice breviter spinoso-aristulatis, omnibus villosulo-tomentosis; pappi setis quam achænium 3-plo longioribus.

Hab. Crescit in angustiis ad Serra da Chapada circa 300 met. alt. supra mare (N. 198.)

Suffrutex metralis, sursum foliigerus. Ramuli teretes, tomento cinereo-velutino obtecti, 0·2–0·3 cm. long. Spinæ 0·5 cm. long., subteretes, acutatæ, leviter arcuatæ. Folia 6·0 cm. long., 3·0–3·3 cm. lat., supra pallidissime nitentia, subtus decoloria; venulæ laxe reticulatæ. Capitulorum glomerulæ plerumque 2·5–4·0 cm. diam. Capitula vix 0·5 cm. diam. Involucri bracteæ extimæ 0·2 cm. long.; mediæ ad 0·4 cm. long. et 0·15 cm. lat. auctæ; intimæ lineari-lanceolatæ, acutæ, 0·6 cm. long., 0·12 cm. lat. Corolla alba, 0·5 cm. long., glabra, ejus lobi apice breviter pilosuli. Achænia 0·2 cm. long.; pappi setæ 0·6 cm. long.

Cum *C. vagante*, Baker, comparanda, abs qua abhorret primo obtutu, inter plura alia, foliis nec spinoso-mucronatis et capitulis minoribus arctius congestis. [Bras. Or., Goyaz.]

Chaptalia integrifolia, Baker, in Mart. Fl. Bras. vii. pars iii. p. 377.

Hab. Reperi ad Serra da Chapada mens. Aug. florentem. (Nn. 124, 178.) [Amer. Trop. et Subtrop.].

Trixis ophiorrhiza, Gardn. in Hook. Lond. Journ. vi. p. 461.
Hab. Floret ad Serra da Chapada mens. Aug. (N. 120.) [Bras. Or., Goyaz.]

LOBELIACEÆ.

Centropogon surinamensis, Presl, Prod. Monog. Lob. p. 48.
Hab. Crescit ad Serra da Chapada, Aug. florens. (N. 157.) [Amer. Trop.]

Siphocampylus corymbiferus, Pohl, Pl. Bras. Ic. ii. p. 112.
Hab. Ad Serra da Chapada reperi mens. Aug. flores præbentem. (N. 195.)

MYRSINEÆ.

Cybianthus (§ Eucybianthus) collinus (sp. nov.); innovationibus arcte rubiginoso-tomentosis, foliis anguste obovato-oblanceolatis, basi longe et sensim cuneatis, apice brevissime acuminatis, pergamenis, supra pallidissime nitidis, subtus decoloribus, crebre minute glanduloso-punctatis; costa media subtus maxime eminente, supra plana vel leviter impressa, deorsum breviter canaliculata, costis secundariis utrovis latere circa 8 (adjectis pluribus tertii ordinis sæpe fere horizontalibus) angulis latis insertis, marginem versus valde arcuatis, racemis speciminis unici mihi obvii plus minus extra-axillaribus, nunquam vere axillaribus; floribus brevissime pedicellatis, bracteis lineari-lanceolatis pedicellos multo excedentibus; calycis lobis ovatis obtusis filamentis usque medium corollæ loborum adnatis, stylo incrassato sursum gradatim attenuato.

Hab. Incolit cacumen montium Serra da Chapada prope Santa Anna da Chapada, mens. Aug. florens. (N. 94.)

Frutex altus, deorsum aphyllus. Ramuli subteretes usque ad 0·4 cm. diam., primum ferrugineo-tomentosi, cito glabri et cortice griseo-bruneo striatulo obducti. Folia matura 18·0–22·0 cm. long. (minora vero occurrunt), paullo infra apicem 5·5–vix 7·0 cm. lat., basi sæpe inæquilatera ad 0·2 cm. angustata, in sicco griseo-virescentia, nequaquam nigricantia, subtus pallidiora. Racemi 7·0–8·0 cm. long., vix ad 0·1 cm. diam., ascendentes, lepidoto-pubescentes, intervallis plerumque 0·2–0·4 cm. long., florigeri. Bracteæ acutatæ, lepidotæ, circa 0·2 cm. long. Pedicelli 0·1 cm. long., 0·8 cm. crass., basi annulatim incrassati. Flores lutescenti-virides, 0·3 cm. diam., semper stricte racemosi calycis lobi 4, 0·1 cm. long. et lat., aliquatenus impares. Corollæ fere usque basin partitæ tubo intus puberulo, lobi 4 vel 5, oblongo-ovati, obtusi, circa 0·17 long., aliquanto recurvi. Filamenta 0·1 cm. infra apicem loborum insertæ; antheræ late ellipticæ, 0·03 cm. long. Ovarium ovoideum, 0·05 cm. diam., stylo æquilongo coronatum. Stigma plane bilobum. Fructus ignotus.

Ni fallor, species juxta *C. nitidum*, Miq., interponenda, sed certe diversa, præter alia, foliis disparibus in sicco haud nigricantibus, racemis semper exaxillaribus, calycis lobis diversis, corollæ lobis longioribus filamentisque iis altius adnatis, itaque stylo incrassato. [Amazonia.]

SAPOTACEÆ.

LUCUMA RAMIFLORA, A. DC. Prod. viii. p. 168 (ex icon. et descript.).

Arbuscula circa 4-metralis, ramulis ultimis solummodo foliatis; ramuli ultimi insigniter geniculati, dense corticati, flores virides. [Bras. Or.]

Hab. Viget ad Serra da Chapada, ubi mens. Aug. florescit. (N. 161.)

Planta a typo, mihi descriptione et icone solummodo cognito, divergens præsertim ob folia conferta et florum fasciculos diffusos nec stricte axillares.

In other details there is so close a resemblance between my specimens and the figure and description of Miquel, that I cannot help thinking the comparatively unimportant divergences from the type to be individual peculiarities.

LOGANIACEÆ.

STRYCHNOS (§ BREVIFLORÆ) MATTOGROSSENSIS (sp. nov.). Frutex scandens, strictirameus, ramulis crebris patentissimis, gracilibus, copiose foliatis, pubescentibus puberulisve, cito glabris, spinis sparsis brevibus vel elongatis rectis vel solemniter paullo recurvis, cirrhis rarissimis bifidis; foliis parvis, membranaceis, petiolatis, ovatis, acuminatis, basi rotundatis vel plerumque rotundato-obtusis, rarius acutis, imâ basi vel paullo supra basin triplinervibus, glabris; cymis quam folia brevioribus, terminalibus, plurifloris, in glomerulas parvas sublaxas dispositis, pubescentibus, glabratis; floribus breviter pedicellatis pentameris; calyce fere usque ad basin diviso, lobis lanceolatis, acuminatis; corollâ albâ usque $\frac{2}{3}$ in lobos oblongos obtusos, intus medio longe villosos divisâ; antheris breviter exsertis, ovatis, apice obtusis vel brevissime mucronulatis.

Hab. Crescit ad Santa Cruz, mens. Nov. florens. (N. 675.)

Frutex ramis primariis elongatis, ramis secundi ordinis abbreviatis. Rami teretes, glabri, cortice griseo abundanter lenticellifero cincti, circa 0·5 cm. long. Ramuli plerique abbreviati, angulis latis sæpe recto vel fere recto inserti, tenues, circa 0·1–0·2 cm. diam. Spinæ raro usque ad 2·5 cm. long., basi 0·2 cm. diam., sæpissime vero breviores, apice acuminatæ, glabræ, oppositæ et æquimagnæ, vel solitariæ ramulo oppositæ, interdum oppositæ, sed maxime inæquales. Cirrhi usque ad 6·0 cm. long., tenues, glabri, sursum incurvi (an unquam visi amplectentes ?), nonnunquam inter ramulos et cirrhos ambigentes. Foliorum laminæ pleræque 3·0–5·0 cm. long., 2·0–3·5 cm. lat., minimæ sæpe cum normalibus intermixtæ, basi sæpe paullulum obliquæ, supra obscure nitidæ, plus minus nigricantes, subtus virides; costæ laterales sursum undulato-arcuatæ, costa inframarginalis prope basin conspicua; venulæ laxe reticulatæ; petioli 0·3–0·5 cm. long., tenues, puberuli. Cymæ pedunculis brevibus nec ultra 0·8 cm. long. (sæpe brevioribus) fultæ, 1·5–2·0 cm. diam.; ramuli patentes, bracteis linearibus vel lanceolatis 0·1–0·2 cm. long. instructi; bracteolæ lanceolatæ, acuminatæ, calycem subæquantes. Flores odorati vix 0·2 cm. diam. Calyx vix 1·5 cm. long., usque $\frac{3}{4}$ divisus. Corolla 0·2 cm. long.; tubus vix 0·07 cm. long. Filamenta ad 0·03 cm. exserta; antheræ 0·06 cm. long.; loculi basi conspicue divergentes. Ovarium glabrum, subglobosum; stylus crassiusculus ovario æquilongus. Bacca ignota.

Species *Strychno nigricanti*, Prog., arcte affinis, sed certe non conspecifica, a calyce fere usque ad basin divisâ (nec vix usque ad medium), corollæ lobis tubo duplo longioribus (nec ei æquilongis), staminibus exsertis, antheris ovatis, loculis basi divergentibus (nec oblongis, loculis basi parallelis), ovario subgloboso nec ovoideo differens. Flores insuper stirpis nostræ albi, nec virides.

Hujus inveni eodem loco mens. Nov. (n. 569) varietatem insequentem:—

Var. SARMENTOSA, nob. Haud scandens, ramosissima, spinis orba (an semper ?).

This variety is merely the non-scandent form of the species. In this state the plant grows isolated, in the form of a shrub with exceedingly copious branching; but none of my specimens show either spines or tendrils, and moreover the internodes are shorter than is the case with the type. *S. nigricans*, Prog., I know only from the excellent figure and description in the volume of Martius. [Bras. Or.]

STRYCHNOS, sp. nov. (?). Frutex altus, forsan ex affinitate *S. smilacinæ*, Benth., uncis magnis maxime incrassatis scandens. Folia magna, brevipetiolata, ovato-lanceolata, acuta vel obtusiuscula, interdum leviter cuspidata, basi attenuata, trinervia, glabra, coriacea, supra nitida, subtus decoloria, usque ad 16·0 cm. long. et 7·0 cm. lat. Bacca magnitudine pruni, sphæroidea, polita, oligosperma. Semina nummulariâ medio levissime elevata, vix circularia, diam. altero 1·7 cm., altero 1·5 cm., testâ membranaceâ bruneâ obducta. Reliqua desunt.

Hab. Inveni fl. Santa Anna imminentem mens. Oct. (N. 574.)

SPIGELIA HUMBOLDTIANA, Cham. & Schlecht. in Linnæa, i. p. 200.

Hab. Crescit in sylvâ primævâ inter Santa Cruz et Tapirapuan, mens. Sept. florens. (N. 374.) [Amer. Trop.]

APOCYNACEÆ.

RAUWOLFIA MOLLIS (sp. nov.); caule erecto, ramoso, subtereti, albide tomentello; foliis brevipetiolatis, ovatis, utrinque attenuatis, apice acutis, interdum breviter cuspidatis, membranaceis, præsertim pag. inf. molliter incano-pubescentibus; petiolis pauciglandulosis; cymulis paucifloris, micranthis, 1 vel 2 bi-tri-chotomis, tomentellis; pedunculis petiolos pluries excedentibus; pedicellis florum apertorum calycem bene excedentibus; calycis pubescentis lobis ovatis, acutis, ciliatis; corollâ calycem plus quam 2-plo excedente extus glabrâ, lobis lineari-oblongis, late truncatis, margine ciliatis, tubo obeso circa 2-plo brevioribus; staminibus prope sinus corollæ affixis; antheris brevissime exsertis; disco gynophoro æquilongo integro; ovario discum 3-plo excedente globoso, sæpe alte bilobo; stylo et stigmate generis; drupâ subovoideâ, aliquanto compressâ, plerumque satis alte bilobâ, lobis acutis.

Hab. Ad Corumbá inveni mens. Jan. flores et fructus simul ostendentem. (N. 950.)

Frutex, altitudine prætermissâ. Ramuli ascendentes, graciles, crebre foliati, dein glabri et fusci, lenticellis albidis sparsis rotundis vel ellipticis inspersi. Folia verticillata,

raro bina, plerumque inæqualia, sc. folium tertium quam alia minus; lamina 2·0–5·0 cm. long., 1·0–3·0 cm. lat., margine leviter undulata, supra viridis, subtus albida; costæ secundariæ 5–8 alternatim insertæ, sensim arcuatæ; petioli non ultra 0·2 cm. long., tomentelli, glandulis paucis stramineis usque ad 0·03 cm. long. onusti. Pedunculi 1·0–1·5 cm. long.; pedunculi secundi ordinis patuli, plerumque circa 0·5–0·8 cm. long. Bracteæ exiguæ, extus pubescentes, usque ad 0·08 cm. long. Cymulæ tempore florendi ± 1·0 cm. diam., 3–12-floræ, raro unifloræ. Pedicelli 0·5 cm. long., patuli. Flos totus vix 0·3 cm. long., virescens. Calyx fere 0·15 cm. long., usque ad medium divisus. Corollæ tubus 0·23 cm. long., vix 0·1 cm. lat., intus superne villosus; lobi intus villosi. Antheræ triangulares, sursum attenuatæ, 0·05 cm. long., apicibus solummodo exsertis. Drupa viva coccinea, in sicco brunea, 0·5 cm. long., vix totidem diam., lobi plerumque usque 0·15 cm. long.

Rauwolfiæ canescenti, Linn., proxima, cujus folia minus mollia, calycis lobi latiores, corollæ lobi breviores, antheræ majores, ovarium parvum discum duplo excedens, necnon drupa integra vel summum brevissime et obtuse biloba. Accedit itaque ad *R. Blanchetii*, A. DC., sed inter pluria alia folia stirpis mei longe disparia, cymulæ patulæ, calyx et corolla diversi, et baccæ quam plurimum brevissime bilobæ. [Bras. Or., Venezuela, Nov. Granat., Ind. Occ.]

THEVETIA BICORNUTA, Muell. Arg. in Linnæa, xxx. p. 392. (*T. paraguayensis*, Britton, in Ann. New York Acad. Sc. vii. p. 158.)

Caulis erectus, nonnunquam ultrametralis. Flores decori, lutei. Bacca (ad Coimbrá solummodo visa) magnitudine pruni, flavo-brunea, lævis.

Hab. Crescit in paludosis prope Corumbá, mens. Jan. florens, itaque in graminosis ad ripas fl. Paraguay juxta Coimbrá flores et fructus fert mens. Feb. (Nn. 950 *a*, 1070 *a*.) [Paraguaria.]

To this species, of which authentic material does not exist in England, undoubtedly belong specimens recently collected by Mr. Graham Kerr on the Pilcomayo River and named by Mr. N. E. Brown, to whom and to Mr. Jackson's invaluable 'Index' I am indebted for the reference to Mueller's paper. Dr. Morong also brought back the same handsome plant from the Pilcomayo.

The original collector of this plant was the late Dr. Weddell, since whose time it was not collected until the Pilcomayo explorers came upon it. There is some doubt where Weddell actually gathered his specimens. In his time the Brazilian frontier did not extend south of Coimbrá, and inasmuch as he spent sixteen days in botanizing at Olympo, in the territory now disputed between Paraguay and Bolivia, it is most probable that he there found the plant now under notice. His party may well, however, have camped for the night upon the eastern side of the river, now, as far as the Rio Apa, in Brazilian hands, or indeed he might have secured the plant at some spot between Coimbrá and the small Rio Branco, at the junction of which with the Rio Paraguay stands the boundary-mark erected by the Brazilio-Bolivian Boundary Commission. In either event the locality would nowadays be a Brazilian one. The extension in the range of this species to Corumbá is interesting.

TABERNÆMONTANA HIRTULA, Mart. ex Muell. Arg. in Mart. Fl. Bras. vi. pars i. p. 73.

Hab. Inveni in fruticetis ad Santa Cruz mens. Sept., necnon in paludosis juxta Corumbá mens. Jan. (Nn. 304, 966.) [Amazonia, Venezuela.]

TABERNÆMONTANA OBLONGIFOLIA, A. DC. Prod. viii. p. 368.

Fruticulus erectus, metralis, superne ramosus ibique tantummodo foliosus. Folia quam in typo minora, scilicet 5·0–8·5 cm. long. et 2·0–3·5 cm. lat., et cum iis stirpis a cl. Glaziou lectæ (n. 14,068), quæ cl. Mez ad hanc speciem ascribit, optime congruentia.

Hab. Crescit ad Santa Cruz mens. Sept. (N. 289.) [Bras. Or., Guiana.]

The flowers of these Tabernæmontanas smell exactly like new-mown hay. I suppose *coumarin* to be the perfume exhaled by them.

SECONDATIA DENSIFLORA, A. DC. Prod. viii. p. 445.

Hab. Floret ad Santa Cruz menss. Nov.–Dec. (Nn. 368, 734.) [Bras. Or., Goyaz, Amazonia.]

PRESTONIA (§ HÆMADICTYON) EVANSII (sp. nov.); ramulis volubilibus, puberulis vel glabris, juxta nodos pubescentibus; foliis majusculis, brevipetiolatis, plerumque plus minus inæquilateralibus, late ovatis, obtusis vel obtusissimis, nonnunquam breviter bilobis aut certe emarginatis, basi rotundatis ibique paullo obliquis, papyraceis, subtus puberulis; cincinnis axillaribus, pedunculatis, quam folia insigniter brevioribus, plurifloris; bracteis ovatis, acuminatis, pedicellis multo brevioribus; calycis ampli fere usque ad basin 5-partiti lobis lineari-lanceolatis, acutis, aliquanto inæqualibus, extus pubescentibus vel puberulis, corollæ tubum subæquantibus; corollæ extus glabræ tubo sub limbo parum attenuato, lobos obovatos obtusos 2-plo excedente, intus faucibus annulo callioso instructis; squamis corollæ linguiformibus annulum haud excedentibus, antheris $\frac{1}{3}$ alt. a basi insertis glabris inclusis, sc. annulum haud excedentibus; disci glandulis ovarium glabrum brevissime excedentibus.

Hab. Viget ad ripas fl. Paraguay inter Santa Cruz et Villa Maria, mens. Dec. florens. (N. 819.)

Ramuli 0·3–0·4 cm. diam., torti, in sicco dilute luteo-brunei. Foliorum lamina usque 15·0 cm. long. 10·0 cm. lat., sed sæpe minor (e. g. 11·0–7·0 cm.), supra nitida, subtus pallidior, in sicco lutescenti-viridis; costa media supra impressa, subtus valde eminens; costæ secundariæ utrinque 6–7 distantes, raro subopposite insertæ, plus minus aperte fornicatæ, sub margine undulatim junctæ; venis conspicuis, laxe reticulatis. Pedunculi 2·0–3·5 cm. long., circa 0·25 cm. diam., rigidi, una cum ramulis sparsim lenticelliferi. Cincinni axis usque ad 2·0 cm. long. (plerumque vero ±1·0 cm.) obesus (circa 0·3 cm. diam.), bracteis crebris 0·2–0·3 cm. long. onustus. Pedicelli 0·5–1·0 cm. long., pubescentes. Flores dilute virides. Calyx totus 1·3 cm. long., laciniæ 1·1 cm. long. 0·25–0·35 cm. lat., utraque basi intus squamâ late ovatâ, apice incisâ, sæpe plus minus alte bilobâ, circa 0·1 cm. long.

instructa. Corollæ tubus 1·5 cm. long. et 0·3 cm. lat. intus prope fauces villosulus, ceteroquin glaber, annulus 0·06 cm. lat.; squamæ 0·15 cm. long., 0·05 cm. lat., ad annulum attingentes, aut paullo breviores; limbi circa 2·0 cm. diam. lobi vix 0·8 cm. long., patuli. Filamenta basi pubescentia. Antheræ circa 0·4 cm. long. Discus paullo ultra 0·1 cm. alt. Stylus ultra 1·0 cm. long., juxta apicem rugatus.

Inter species Brasilienses accedit ad *Prestoniam Gaudichaudii* (*Hæmadictyon Gaudichaudii*, A. DC.), cujus folia disparia, nempe insigniter angustiora, pedunculi longiores, calyce et corolla minores, etc. [Bras. Or., Amazonia.]

ANISOLOBUS ZUCCARINIANUS, Miers, Apoc. S. Amer. p. 171. (*A. hebecarpus*, Muell. Arg., var. *erectus*.)

Hab. Crescit ad Cuyabá, ubi mens. Aug. floret. (N. 40.) [Bras. Or.]

The leaves of my plant are smaller than those of the type, and the disk is somewhat shorter, but I have no doubt about the identification, particularly as the type has been found at Cuyabá.

ECHITES (§ MESECHITES) SANCTÆ-CRUCIS (sp. nov.); ramulis tenuibus, puberulis; foliis distantibus breviter ac tenuiter petiolatis, ovato-oblongis, raro ovatis, cuspidatis vel breviter cuspidato-mucronatis, deorsum paullo attenuatis, et reverâ basi rotundatis vel brevissime cordatis, nonnunquam acutatis, tenuiter coriaceis, subobsolete puberulis; pedunculis quam folia brevioribus, rigidis, ascendentibus, puberulis; bostrycibus abbreviatis, simplicibus vel bifidis, congestifloris, crebre bracteatis, puberulis; bracteis exiguis, ovatis vel rotundatis, obtusis, extus puberulis; floribus longiuscule pedicellatis; pedicellis arrectis, puberulis; calycis puberuli pedicellis circa 2-plo brevioris lobis ovatis, obtusis vel subacutis; corollæ tubo extus puberulo, medio constricto, utrinque ampliato, paullo supra medium staminigero, lobis cordatis acutiusculis a tubo 4-plo superatis; disci glandulis elongatis, subliberis, ovario brevioribus; ovario elongato.

Hab. Crescit ad Santa Cruz, ubi floret mens. Nov. (N. 604.)

Ramuli teretes, 0·1–0·15 cm. diam., intervallis plerumque 5·0–14·0 cm. foliigeri. Folia pleraque 6·5–8·0 cm. long. et 2·5–3·5 (raro 2·0 vel 4·5) cm. lat., supra nitida, subtus pallida; costæ secundariæ utrinque 5–7, distantes, alternatim raro opposite vel subopposite insertæ, plus minus undulatim arcuatæ; petioli circa 1·0 cm. long., patentes, puberuli. Pedunculi 1·0–2·0 cm. long., 0·1 cm. diam. Bostryces plerumque 10–25-floræ, nec ultra 0·8 cm. long. et 0·2 cm. lat. Bracteæ usque ad 0·1 cm. long., margine ciliatæ. Pedicelli usque ad 1·0 cm. long. Calyx 0·4 cm. long., ad medium partitus, intus basi squamis late ovatis, apice erosis, plerumque alte bifidis, 0·06 cm. long. auctus. Corolla pæne 2·0 cm. long., viridis; tubus 1·7 cm. long, basi 0·3 cm. lat.; limbus 0·5 cm. diam. Disci lobi 0·18 cm. long., late lineares, obtusissimi, carnosuli. Ovarium 0·25 cm. long. sæpe inæquilaterale, puberulum. Follicula maxime immatura, apice solummodo connata, puberula.

Certe ad *E. trifidam*, Jacq. (*Mesechitem trifidam*, Muell. Arg.), spectat, sed ob indumentum, flores minores, ovarium et discum multo majores et reverâ illud hunc

bene excedens, præter alia, nullo negotio distinguenda. [Amazonia, Guiana, Venezuela, Ind. Occ.]

RHODOCALYX ROTUNDIFOLIUS, Muell. Arg. in Mart. Fl. Bras. vi. pars i. p. 173.

Hab. Juxta Santa Cruz menss. Oct. et Nov. flores theobrominos profert. (N. 460.)

Rhizoma siccum, ultra 1·0 cm. crass., longitrorsum sulcatum, pallide bruneum; ob ejusdem decocti proprium purgans ab incolis in loco medicamenti æstimatione dignandi habetur. [Bras. Or., Bolivia.]

RHABDADENIA POHLII, Muell. Arg. in Mart. Fl. Bras. vi. pars i. p. 174.

Hab. Incolit paludosos ad Carandajinho, inter Corumbá et Dorados; occurrit itaque ad Corumbá fl. mens. Jan. (Nn. 1007, 1044.) [Bras. Or.]

ASCLEPIADEÆ.

OXYPETALUM (§ LYRODUS) CLAVIGERUM (sp. nov.); caudice ignoto, caule recto, terete, molliter villosulo-tomentoso; foliis brevipetiolatis, angustis, lineari-lanceolatis, breviter acuminatis, mucronatis, basi truncato-rotundatis, utrinque (præcipue subtus) molliter tomentellis; pedunculis folii dimidium fere æquantibus erectis, villosulo-tomentosis; capitulis paucifloris; floribus brevissime pedicellatis, mediocribus; calycis hirsutuli segmentis lineari-lanceolatis, corollæ tubum paullo superantibus; corollæ tubo extus hirsutulo; limbi lobis lanceolatis, obtusis; coronæ phyllis exsertis, ovatis, usque ad medium bilobis; lobis lineari-lanceolatis, obtusis; acumine stylari coronæ phylla superante clavellato, apice breviter bilobo.

Hab. Ad Jangada floret mens. Sept. (N. 287.)

Caulis ex schedis meis circa 20·0 cm. alt., vix 0·2 cm. diam.; internodia 2·5–3·0 cm. long. Folia 2·5–3·5 cm. long., 0·7–1·0 cm. lat., firma; petioli 0·4 cm. long., villosulo-tomentosi. Pedunculi paullo ultra 1·0 cm. long. Capitula depresse sphæroidea, vix 1·5 cm. diam., circiter 8-flora. Calyx 0·4 cm. long.; glandulæ, in seriebus segmentorum sursum sitæ, paucæ (circa 3). Corollæ tubus 0·3 cm. attingens; lobi 0·4 cm. long., extus hirsutuli. Coronæ phylla 0·35 cm. long., vix 0·2 cm. lat. Stylus 0·25 cm. long., 0·08 cm. lat., lobi vix 0·1 cm. long., incurvi. Follicula ignota.

Differt inter alia:

(1) Ab *O. Martii*, Fourn., floribus majoribus, calyce, corollâ, coronâ, stylo et stigmate disparibus.

(2) Ab *O. capitato*, Mart., calycis segmentis majoribus, lobis corollæ et coronæ phyllis diversis, acumine stylari abbreviato, incrassato, latius lobato.

(3) Ab *O. stigmatoso*, Fourn., foliis minoribus, corollæ lobis basi nequaquam villosis, coronæ phyllis tantum bifidis nec fere usque ad basin fissis, necnon stylo et stigmate disparibus.

(4) Ab *O. proboscideo*, Fourn., foliis petiolatis, haud basi caudatis, calycis lobis

corollæ tubum excedentibus, corollæ lobis nec acutis nec rubro-vinosis, coronæ phyllis neque profunde fissis nec cristâ instructis.

(5) Ab *Oxypetalo glomerato*, Fourn., foliis minoribus petiolatis, floribus haud umbellatis coronâ dispari, necnon stylo comparative abbreviato. [Bras. Or., Goyaz.]

Asclepias jangadensis, S. Moore; caule humili, subsimplici, saltem in sicco ancipite, e rhizomate crassiusculo, fibras plures simplices deorsum corticato-incrassatas gerente, erecto; foliis sessilibus, elongatis, linearibus, acutis, basin versus coarctatis, papyraceo-coriaceis; pedunculis quam folia brevioribus, erectis, terminalibus vel ex axillis foliorum superiorum ortis; umbellis circa 12-floris; bracteis exiguis, subulato-linearibus; corollâ viridi, cucullorum dilute puniceorum ore superiore sat magno, ovato, obtusissimo, introrsum non producto, gynostegium excedente; corniculo falciformi; folliculis ignotis.

Hab. Crescit ad Jangada in loco arenoso tempore pluviorum inundato; fl. mens. Sept. (N. 251.)

Radices usque ad 0·15 cm. diam., in sicco bruneæ. Rhizoma 0·5 cm. diam., abbreviatum. Caulis circa usque 20·0 cm. alt., crasse corticatus, albide pubescens, superne sublanatus, 0·3 cm. diam., internodia ad 6, maxime inæquilonga. Folia 6·0–10·0 cm. long., exempli alterius nec ultra 0·3 cm., alterius 0·5–0·7 cm. lat., utrinque albido-pubescentia. Pedunculi 2·0–3·0 cm. long., sublanati. Umbella 2·5–3·5 cm. diam.; bracteæ 0·2 cm. long. Pedicelli patuli, circiter 1·0 cm. long. Flores expansi circa 1·2 cm. long. Calycis segmenta ovato-lanceolata, acuta, sublanata, vix usque ad 0·3 cm. long. Corollæ lobi oblongi, apice oblique et breviter inciso-retusi, 0·7 cm. long. Cuculli a basi sensim dilatati, gynostegio 0·2 cm. longiores, vix 0·5 cm. long., eorum os superius pæne 0·2 cm. long., 0·16 cm. lat., corniculus 0·35 cm. long. Gynostegium 0·26 cm. long.

Species inter *A. mellodoram*, St.-Hil., et *A. nervosam*, Decne., medium tenens. Cum hâc habitu optime congruit, quæ distat vero ob flores minores albos, lobos calycis minores necnon angustiores, corollæ lobos breviores et latiores, cuculli os superius introrsum dentatum. Habitum disparem ostendat *A. mellodora*, cujus folia latiora, calyx longior, cucullus minor pallide lutescens, gynostegium æquans, ore superiore exiguo gaudiens. [Bras. Or., Goyaz, Bolivia.]

Morrenia incana (sp. nov.); novellis incano-tomentosis; ramis elongatis, incrassatis, teretibus, minute albido-tomentosis; foliis petiolatis, plus minus anguste hastatis, acuminatis vel acutis, basi truncatis vel parum ac latissime cordatis, supra pubescentibus vel puberulis, subtus incano-tomentosis; petiolis abbreviatis a laminâ insigniter superatis; corymbis fere subsessilibus, brevibus, densifloris, incano-tomentosis; pedicellis flores subæquantibus, incano-tomentosis; floribus mediocribus; calycis profunde 5-partiti segmentis lineari-lanceolatis, corollâ subtriplo brevioribus; corollâ viridi, paullo ultra $\frac{2}{3}$ in lobos lanceolatos obtusos divisâ, membranaceâ, nunc breviter, nunc alte 5-lobâ, gynostegium paullo superante; corollâ subduplo breviore.

Hab. Reperi ad Puerto Pacheco florentem mens. Feb. (N. 1060.)

Caulis vix 0·3 cm. diam., tortus, intervallis usque 13·0 cm. long. (sæpe vero circa 7·0–8·0) foliigerus. Foliorum lamina 5·5–7·0 cm. long., basi 1·7–2·5 cm. lat. (medio 0·7–1·0 cm.), subtus perpetuo tomentosa; costa media lata, præsertim pag. inf. eminens. Pedunculi circiter 0·5 cm. long., satis crassi; pedicelli florum apertorum usque ad 0·7 cm. long. Calycis incani lobi 0·3 cm. long., acuti, intus pubescentes. Corolla 1·2 cm. diam., 0·8 cm. long., extus pubescens; tubus 0·25 cm. long., longitrorsum rugatus, faucibus pilosulus; lobi intus glabri. Corona vix 0·3 cm. long., extus deorsum rugulata, intus ore albido-villosula. Antherarum membrana generis. Gynostegium 0·2 cm. alt. Acuminis stylaris lobi lineares, erecti, coronam paullo excedentes. Folliculi ignoti.

Speciebus ab duabus hucusque cognitis abhorret indumento tomentoso perpetuo, corymbis incanis, corollâ brevius divisâ, columnæ stylaris lobis longioribus, etc. [Uruguaria, Argentina, Paraguaria, Bolivia Or.]

An interesting addition to this small genus; the variation in the extent of lobing of the corona is curious.

Fournier speaks of the corona as being 10-lobed, the 5 alternate lobes being dentiform. Endlicher also mentions the interposed teeth. In the present species, as also in *M. brachystephana*, Griseb., the teeth certainly do not exist, although Grisebach, after describing the corona of *M. odorata* as 5-lobed, says that *M. brachystephanus* has it 10-lobed, which is certainly incorrect. Fournier's figure in Martius's Fl. Bras. (vi. pars iv. t. 83) shows the 5 interposed lobes very clearly; but I cannot help thinking that the supposed small lobes are really folds in the corona, the sides of whose lobes are folded inwards to a great extent so as to face one another.

MARSDENIA CAULANTHA (sp. nov.); novellis dense fulvo-tomentosis; caule volubili, subtereti, crassiusculo, velutino-tomentoso, dein cinereo et pubescente, vix glabro; foliis petiolatis, ovatis, acutis, sursum gradatim attenuatis, interdum leviter cuspidatis, basi obliquis, rotundatis, nonnunquam leviter cordatis, utrinque molliter velutinis, subtus pallidioribus; cymis brevipedunculatis, ex axillis foliorum evanidorum sæpe ortis, densifloris; pedicellis brevibus, tomentosis; calycis tomentosi lobis abbreviatis, obtusis, oblongo-ovatis, faucem corollæ nequaquam attingentibus; corollæ sordide viridis tubo mediocriter elongato-urceolari, intus medio villosulo, ceterum glabro vel aliquatenus puberulo, faucibus carnosulo-annulato, lobis ovatis obtusissimis, extus tomentosis, intus glabris; coronæ phyllis abbreviatis, obtusis; antherarum membranâ parvâ, ovatâ, stigma paullo excedente; stigmatis rostro pyramidali-subgloboso, muriculato; polliniis inferne attenuatis, in stigmate incumbentibus, retinaculo insigniter longioribus.

Hab. Florescit ad Santa Cruz mens. Nov. (N. 407.)

Caulis proventu circa 0·5 cm. diam., ætate aphyllus, dense corticatus, cortice cinereo diu plus minus pilifero. Folia 4·5–6·0 cm. long., 3·0–3·3 cm. lat., aliquanto inæquilatera, margine ciliata, petiolis ascendentibus 1·0–1·3 cm. long. suffulta. Pedunculi usque ad 0·5 cm. long., sæpe subobsoleti, dense tomentosi. Calyx 0·3 cm. long., usque ad

$\frac{5}{6}$ divisa, lobi aliquanto impares, intus superne appresse puberuli, ceterum glabri. Corolla 0·6 cm. diam.; tubus 0·3–0·4 cm. long., 0·3 cm. lat., extus superne tomentellus, inferne glaber. Gynostegium vix 0·2 cm. alt. Coronæ squamæ et antherarum membranæ minutæ. Pollinia minima, minutissime verruculosa. Stigmatis rostrum circa 0·05 cm. alt.

Primo aspectu nullâ pro specie hujus generis haberi nisi pro *Marsdeniâ mollissimâ*, Fourn., quam habitu et indumento refert. Flores attamen *M. mollissimæ* multo majores, calycis lobi oblongo-lineares et comparative elongati, corolla infundibularis circa duplo longior lobis multo majoribus extus pubescentibus nec tomentosis instructa, gynostegium et coronæ squamæ et antherarum membranæ insigniter majores. Pollinia duplo majora lævia nec verruculosa. [Bras. Or., Guiana.]

Madarosperma oblongum (sp. nov.); caule volubili, gracillimo, apice defoliato, arcte pubescente; foliis petiolatis, oblongis vel lanceolato-oblongis, apice apiculatis, basi obtusis, molliter pubescentibus; cymulis sessilibus vel subsessilibus, paucifloris; pedicellis abbreviatis; calycis lobis ovatis, obtusis, corollæ tubo paullo brevioribus; corollæ tubo ventricoso, lobos ligulatos æquante; coronæ phyllis gynostegium paullo superantibus, ovatis, acuminatis, basi gynostegio breviter adnatis, omnino planis; gynostegio pentagonali; antherarum membranâ lanceolatâ, obtusâ; stigmate prominulo.

Hab. Reperi in ripâ fl. dos Bugres vigentem et mens. Oct. florentem. (N. 431.)

Caulis nec ultra 0·1 cm. diam., subteres, leviter striatus. Folia 2·0–4·0 cm. long., 0·8–1·5 cm. lat., coriacea, sæpe in sicco fusco-virentia, subtus decoloria; costæ secundariæ utrinque 3–4, oblique insertæ, a costâ submarginali undulato-curvatâ conjunctæ, parum conspicuæ; venulæ subevanidæ. Cymulæ 2–6-floræ, raro ad florem unicum reductæ, usque ad 0·35 cm. diam., axillares vel terminales, nonnunquam ramulos abbreviatos coronantes et tunc pseudopedunculatæ. Flores virides. Calycis extus piloso-pubescentis lobi 0·1 cm. long. Corollæ tubus 0·13 cm. long., 0·17 cm. diam.; limbus 0·2 cm. diam. Coronæ phylla 0·1 cm. long. Fructus maturus haud visus.

A *M. Trailliano*, Benth., distat foliis disparibus, pedunculis et pedicellis abbreviatis, calycis lobis insigniter majoribus, coronæ phyllis disparibus et revera latioribus, basi planis, nec hippocrepiformibus. Flores virides nec lutei. [Amazonia.]

GENTIANEÆ.

Coutoubea ramosa, Aubl. Pl. Guyan. i. p. 74.

Hab. Crescit ad Santa Cruz, ubi flores albos præbet mens. Sept. (N. 302.) [Bras. Or., Goyaz, Guiana, Amazonia.]

HYDROPHYLLACEÆ.

Hydrolea spinosa, Linn. Sp. Pl. ed. I. p. 328.

Hab. Ad ripas fl. Cuyabá, inter Dorados et Cuyabá, mens. Aug. floret et fructificat. (N. 1.)

HYDROLEA SPINOSA, Linn., var. INERMIS, Spruce.

Hab. Floret ad Santa Cruz mens. Nov. (N. 526.) [Amer. Trop. et Subtrop., Ind. Occ.]

BORAGINEÆ.

CORDIA (§ GERASCANTHUS) JUCUNDA (sp. nov.); ramulis validis, subteretibus, glabris; calyce elongato ventricoso-cylindrico, longitudinaliter sulcato, griseo-velutino, pluridentato, dentibus sæpe inæqualibus deltoideis, interdum longe acuminatis; corollæ magnæ tubo attenuato, in sicco calycem bene excedente, lobis late oblongis obtusissimis; staminibus juxta fauces corollæ insertis.

Hab. Matto Grosso (*Leeson*, in Herb. Mus. Brit.).

Arbor parva, nisi fallor reminiscendo circa 4-metralis. Ramuli 0·6 cm. diam., cortice purpureo-bruneo nitente, in longitudinem crebre striato, albo-lenticellifero obducti. Folia desunt. Cymæ terminales, multifloræ, 11·0–14·0 cm. diam. Flores albi, dense aggregati, foliis haud coetanei. Pedunculi et pedicelli ferrugineo-tomentosi. Calyx 1·5 cm. long., inferne 0·6, superne 0·4 cm. diam., 10-sulcatus, utrinque tomentosus. Corolla subhypocraterimorpha, marcescens, 3·5 cm. diam., tubus circa 1·5 cm. long. et 0·12 cm. lat., deorsum subito ad 0·35 cm. amplificatus; fauces dilatatæ, pentagonæ; lobi 1·2–1·3 cm. long., 1·1 cm. lat., margine undulati, horum nervi extus prominuli et glabri. Stamina ad 1·25 cm. a basi tubi inserta; filamenta 1·0 cm. long., basi incrassata ibique sericeo-pubescentes; antheræ obliquæ, 0·4 cm. long. Ovarium anguste ovoideum, glabrum, vix 1·0 cm. long. prope apicem obtusum subito attenuatum. Stylus filiformis, circa 2·5 cm. long., basi incrassatus. Stigmata filiformia 0·3 cm. long., usque ad medium bifida.

C. insigni, Cham., proxima, at certe diversa species floribus dense glomeratis, foliis haud coetaneis, calycis minoris indumento et dentibus disparibus, corollæ tubo attenuato, lobi nervis glabris, staminibus juxta fauces nec infra medium tubi insertis, ovario anguste ovoideo nec cylindrico, etc. [Bras. Or.]

I feel sure that this is the *Cordia* I saw in flower in a wood close to Corumbá in the month of August, and in the above description of the habit and colour of the flowers that belief has been acted upon. The plant referred to bore similar dense masses of large flowers at a time when leaves were not to be seen, a fact, unless I mistake, not known of other species of *Cordia* § *Gerascanthus*.

CORDIA SALZMANNI, DC. Prod. ix. p. 494.

Hab. Suffrutex metralis, ramosus, viget in locis apertis in cacumine montium Serra da Chapada, mens. Aug. florens. (N. 129.) [Bras. Or., Goyaz, Amazonia, Peruvia, Bolivia, Paraguaria.]

CORDIA CURASSAVICA, Roem. & Schult. Syst. Veg. iv. p. 460.

Hab. In ripâ fl. Paraguay, haud procul a monte Pão d'Assucar dicto, floret mens. Feb. (N. 1086.) [Amer. Austr.]

HELIOTROPIUM FILIFORME, H. B. K. Nov. Gen. et Sp. iii. p. 86.

Hab. Abundat in humidis ad Santa Cruz, ubi flores albos mens. Nov. præbet; itaque inveni in ripâ fl. Brasinho mens. Oct. (Nn. 428, 589.) [Amer. Trop.]

HELIOTROPIUM INDICUM, Linn. Sp. Pl. ed. I. p. 130.

Hab. Frequens passim in provinciâ ad ripas fll. Paraguay, dos Bugres, et Brasinho. (N. 633.) [In tropicis late diffusum.]

HELIOTROPIUM INUNDATUM, Sw. Fl. Ind. Occ. i. p. 343.

Hab. Crescit in paludosis juxta Santa Cruz, menss. Sept.-Nov. florens. (Nn. 354, 603.) [Bras. Or., Amazonia.]

CONVOLVULACEÆ.

IPOMŒA (§ PHARBITIS) CRINICALYX (sp. nov.). Volubilis, foliis parvis, petiolatis, late ovato- vel reniformi-cordatis acuminatis vel breviter bilobis, membranaceis, margine repandis, glabris; pedunculis petiolos subæquantibus, 1–3-floris, pedicellis mediocribus; bracteis oblongo-ovatis vel lineari-lanceolatis, calyci subæquilongis vel eo brevioribus; pedicellis pedunculo brevioribus, glabris vel apice parce puberulis; calycis lobis oblongo-lanceolatis obtusis, dense et patule echino-hirtulis, interioribus latioribus et superne plus minus glabris.

Hab. Crescit ad Corumbá, ubi floret mens. Jan. (N. 953.)

Caulis glaber vel parce puberulus, 0·1–0·2 cm. diam. Foliorum lamina usque 4·0 cm. long. et 6·0 cm. lat. (mediocres $3{\cdot}0 \times 5{\cdot}0$ cm.), palmatim 5–6-nervis, sinu basali 1·5–3·0 cm. lat.; petioli 2·0–3·0 cm. long., patuli, glabri. Pedunculi axillares, 1·5–3·0 cm. long., glabri, deorsum incrassati. Pedicelli usque ad 2·0 cm. long. Calyx 1·6 cm. long., crinibus fulvis 0·4 cm. attingentibus dense obsitus. Corolla purpurea expansa 6·0 cm. long.; tubus basi 0·7 cm. lat., sub flore ad 2·5 cm. ampliatus; limbus circiter 4·5 cm. diam.

Species distinctissima; sine dubio ad *I. echinocalycem*, Meissn., spectat, divergit vero, ut ex icone optimâ patet, foliis omnino disparibus, scilicet multo minoribus, cordato-reniformibus, glabris, caule nequaquam hirsuto, pedunculis longioribus interdum 2- vel etiam 3-floris, bracteis insigniter longioribus, etc. [Bras. Or.]

IPOMŒA NIL, Roth, Catal. Bot. i. p. 36.

Hab. Crescit in campis juxta fl. Paraguay inter Villa Maria et Corumbá, mens. Dec. florens. (N. 848.) [Late diffusa.]

IPOMŒA FISTULOSA, Mart. ex Choisy in DC. Prod. ix. p. 349.

Hab. Occurrit ad ripas fl. Paraguay vulgatissima. (N. 908.) [Bras. Or., Goyaz, Paraguaria, Amazonia, Amer. Centr.]

This is one of the commonest, if not the commonest, of streamside plants edging the river Paraguay from Paraguay northward.

Ipomœa umbellata, G. Meyer, Prim. Fl. Esseq. p. 99.

Hab. Crescit ad ripas fl. Cuyabá passim, ubi flores mens. Aug. ostendit. (N. 4.) Forma pusilla, umbellis bifloris. Flores flavi. [Amer. Trop.]

Ipomœa digitata, Linn. Syst. ed. X. p. 924.

Hab. Floret ad Corumbá mens. Jan. (N. 972.) [Late diffusa.]

Ipomœa setifera, Poir. Encyc. vi. p. 17. (*Calystegia setifera*, Meissn.)

Hab. Crescit ad ripas fl. Paraguay haud procul a Tres Barras, inter Santa Cruz et Diamantino, ubi mens. Oct. floret. (N. 488.) [Amazonia, Guiana, Amer. Centr., Ind. Occ.]

Convolvulus prælongus (sp. nov.); caule volubili, patule hispidulo-piloso; foliis longipetiolatis, indivisis, ovatis acuminatis, basi cordatis vel rotundatis, appresse pilosis, tenuiter membranaceis; pedunculis longissimis, folia multo excedentibus, sat validis, hispidulo-pilosis, plurifloris; floribus arcte confertis, brevipedicellatis; bracteis maxime elongatis, lineari-lanceolatis, acuminatis, hispidulo-villosulis; calycis lobis tenuiter membranaceis, bracteis similibus nisi minoribus; corollâ pro genere magnâ, extus puberula; stigmatis lobis linearibus, parum complanatis; ovarii septo perfecto.

Hab. Viget in loco ignoto, verisimiliter aut ad Santa Cruz aut in ripâ fl. Paraguay inter Santa Cruz et Diamantino. (N. 1101 *a*.)

Caulis usque 0·2 cm. diam., tortus, in sicco dilute lutescenti-bruneus, pilis albidis usque ad 0·25 cm. long. instructus. Foliorum lamina 7·0 cm. long., 4·0–4·5 cm. lat., basi in petiolum decurrens, sursum in acumen circa 1·0 cm. long. desinens, margine repanda, ciliata, basi palmatim 3–5-nervis; costis supra planis, subtus eminentibus; costa media (præsertim inferne) lata; costæ secundariæ (basalibus sæpe parumper dichotomis exemptis) utrovis latere 4–5, oblique insertæ, ascendentes, plus minus undulatæ, parum arcuatæ; petioli 4·0–5·0 cm. long., complanati, hispidulo-pilosi. Pedunculi 18·0–20·0 cm. long., teretes, deorsum fere 0·2 cm. diam., sursum debiliores et hispidulo-villosuli. Inflorescentia nonnunquam usque ad 12-flora, foliis floralibus paucis subruticillatis vegetativis subsimilibus nisi minoribus suffulta. Pedicelli usque ad 0·3 cm. long., basi bracteati, villosuli. Bractea florum apertorum circa 1·3 cm. long. et 0·25 cm. lat. Calycis lobi 1·0 cm. long., inferne 0·2 cm. lat., ibique glabri vel fere glabri, superne usque ad 0·02 cm. attenuati ibique hispidulo-pilosi. Corolla circa 2·5 cm. long. et 1·5 cm. diam. Filamenta inæqualia, glabra, basi parum dilatata; antherarum anguste oblongarum loculi basi divergentes ibique truncati, 0·2 cm. long. Ovarium oblongum, glabrum; stylus 1·0 cm. long.; stigmatis lobi 0·13 cm. long., apice obtusi. Fructus ignotus.

Species memorabilis, neque ulli ex Americâ australi missæ similis habitu; plures in Africâ tropicâ repertas aliquatenus refert.

EVOLVULUS NUMMULARIUS, Linn. Sp. Pl. ed. II. p. 391.

Hab. Floret in arenosis temp. pluviorum inundatis ad Jangada mens. Sept. (N. 259.) [Amer. Trop.]

CUSCUTA OBTUSIFLORA, H. B. K. Nov. Gen. et Sp. iii. p. 122.

Hab. Reperi ad Corumbá mens. Jan. florentem. (N. 1036.) [Late diffusa.]

SOLANACEÆ.

SOLANUM (§ PACHYSTEMONA, MEGALOPORA) CORUMBENSE (sp. nov.). Fruticosa, ramosa; ramulis undulatis, passim geniculatis, velutino-tomentosis, parumper glabris; foliis solitariis vel subgeminis, longiuscule petiolatis, ovatis acutis vel obtusis, nonnunquam leviter cuspidatis, basin versus in petiolum sensim et sæpe longiuscule attenuatis, utrinque minute puberulis vel solummodo subtus pubescentibus, cymis subcorymbiformibus, paucifloris, a pedunculis petiolos subæquantibus fultis; floribus parvulis; calycis campanulati piloso-pubescentis lobis brevibus, late triangularibus, apice sæpe induratis; corollâ subcarnosulâ; baccâ ignotâ.

Hab. Crescit ad Corumbá, mens. Jan. florens. (N. 974.)

Frutex circa trimetralis, abundanter ramosus. Rami defoliati 0·5–0·6 cm. diam., cortice bruneo lenticellis sparsis majusculis prominulis instructo obtecti; ramuli foliati usque ad 0·2 cm. diam., teretes. Folia 5·0–7·5 cm. long., 2·5–4·5 cm. lat., tenuiter membranacea; costæ secundariæ utrovis latere 6·7, ascendentes, leviter arcuatæ; petioli pubescentes, 1·0–1·5 cm. long., erecti vel patuli. Pedunculi plerique 1·5–2·5 cm. long., erecti, pubescentes. Cymæ plerumque 6–7-floræ, circa 1·5 cm. diam. Pedicelli graciles, puberuli, 0·5–1·2 cm. long. Flores albi, vix 1·5 cm. diam. Calyx vix 0·3 cm. long. et lat., supra medium breviter angustatus, lobi 0·1 cm. long., aliquatenus inæquilati. Corollæ longe ultra medium 5-partitæ, lobi oblongo-lineares, obtusi, marginibus inflexis, 0·7 cm. long., 0·3 cm. lat., extus sub margine pubescentes. Stamina parum inæqualia; antheræ corollæ lobis ½-plo breviores, oblongæ, inferne paullulum angustatæ, 0·15 cm. lat., loculis interdum inæquilongis in filamentis complanatis 0·1 cm. long. insidentibus. Ovarium ovoideum, circa 1·0 cm. alt.; stylus superne curvatus, 0·65 cm. long. Stigma capitatum.

Ab *S. campaniformi*, Roem. & Schult., discrepat indumento, foliis basi in petiolum gradatim desinentibus, floribus minoribus, corollæ lobis angustioribus, staminibus longioribus, stylo elongato, etc. [Bras. Or.]

SOLANUM (§ PACHYSTEMONA, MEGALOPORA) SALTIENSE (sp. nov.). Fruticosa, ramosa; ramulis hirsuto-pubescentibus, glabris; foliis maxime inæqualibus, plerumque solitariis, interdum vero geminatis, lanceolatis, longe cordato-acuminatis, basi obtusis, obliquis, nunc in petiolis brevibus insidentibus, nunc subsessilibus, utrinque hirtulo-pubescentibus; cymis plerisque 4–8-floris, umbellatis; pedunculo brevissimo, incrassato; pedicellis elongatis et reverâ floribus multo longioribus, hirsuto-pubes-

centibus; floribus parvulis; calycis campanulati, hirsuto-pubescentis, longilobi lobis lanceolatis acutiusculis, apice haud induratis; corollæ membranaceæ tubo brevissimo; bacca ignota.

Hab. Viget in sylvâ primævâ inter Santa Cruz et Campos de Tapirapuan, ubi floret mens. Sept. (Nn. 377, 377 *a.*)

Rami crebre foliati, circiter 0·2–0·3 cm. diam. Folia 3·5–12·5 cm. long., 1·0–3·5 cm. lat. (mediocria 6·0–7·0 × 2·0–2·5 cm.); costæ secundariæ circa 8, erecto-ascendentes, parum arcuatæ; petioli 0·2–0·3 cm. long. Pedunculi 0·15 cm. long. et diam., hirsuti. Pedicelli sub flore 1·0–1·3 cm. long., cito usque ad 2·0 cm. elongati. Flores 1·0 cm. diam., albi. Calycis 0·6 cm. diam. tubus 0·2 cm. long., lobi 0·4 cm. long., parum inæquilati, post anthesin mox ampliati. Corollæ tubus vix ultra 0·1 cm. long., lobi ovato-lanceolati, extus apicem versus pubescentes, ceteroquin glabri, 0·3 cm. long. Antheræ 0·2 cm. long., late oblongæ, parum inæquales, filamentis brevissimis fultæ. Ovarium ovoideum, glabrum, 0·05 cm. long.; stylus 0·35 cm. long., inferne villosulus, superne glaber, curvatus; stigma anguste claviforme.

Mihi videtur ad *Solanum gemellum*, Mart., spectare, cujus indumentum molle, folia sæpius gemina, longius petiolata, basi rotundiora, et, præter alia, flores majores, calyx diversiformis, et corolla 5-angularis. [Bras. Or.]

Solanum (§ Acanthophora) vexans (sp. nov.); ramulis fistulosis, subteretibus, una cum foliis et petiolis arcte pubescentibus, aculeis longis, validis, stamineis subsparsim instructis; foliis longipetiolatis, minute pubescentibus, ovatis vel cordatis, subacutis, in utroque margine impariter 5–7-lobulatis, sursum lobulato-dentatis, lobulis triangularibus vel deltoideis acutis, plerumque integris, inermibus; cymis sæpe 4-floris, pedunculis brevibus fultis; pedunculis, pedicellis, calycibus, et corollis pubescentibus; floribus inermibus; calyce late campanulato ad usque medium 5-lobo, lobis triangulari-ovatis obtusissimis; corollâ membranaceâ, alte 5-partitâ; baccâ ignotâ.

Hab. Schedula prætermissa; incolit locum quendam ignotum, an Santa Cruz? (No. 1111 *a.*)

Frutex? altitudine incertâ. Ramuli usque ad 0·5 cm. diam., aculeis nunc brevibus (0·1–0·2 cm. long.), nunc elongatis (1·3 1·7 long.) instructi; aculei omnes recti, rarissime paullo recurvi, a latere compressi. Foliorum lamina usque ad 11·0 cm. long. et 8·0 cm. lat., firme membranacea; costæ secundariæ 5–6, angulis latis insertis rectis vel fere rectis, adjectis pluribus tertii ordinis, costæ omnes subtus eminentes, aculei foliorum sparsi, præsertim ex costâ mediâ orti, plerumque elongati; petioli 7·0 cm. long., validi, pubescentes. Pedunculi usque 1·0 cm. long., una cum pedicellis plermuque 0·5–0·8 cm. long., pubescentes. Calyx 0·4 cm. long., 0·6 cm. lat. Corollæ tubus 0·2 cm. long.; lobi ultra 1·0 cm. attingentes, lineari-lanceolati. Antheræ, filamentis brevissimis insidentes, lanceolatæ, inæquales, 0·9–1·1 cm. long. Ovarium parvum, globosum, glabrum, stylo æquilongum; stylus glaber, crassiusculus, vix 0·1 cm. long. Stigma capitatum.

Nisi fallor, juxta *S. palinacanthum*, Dun., intercalandum; ab eo abhorret equidem

spinis paucioribus, calycis inermis lobis brevioribus et latioribus, corollæ lobis disparibus, antheris aliquanto latioribus et longioribus, stylo breviore, etc. Ob habitum accedere videtur ad *S. platanifolium*, Hook., cujus flores attamen longe dispares. [Bras. Or.]

Solanum macranthum, Dun. in DC. Prod. xiii. 1, p. 315.
Hab. Crescit ad Serra da Chapada, mens. Aug. florens. (N. 103.) [Amazonia, Guiana.]

Solanum sisymbrifolium, Lam. Illustr. n. 2386.
Hab. Matto Grosso (*Leeson*, in Herb. Mus. Brit.). [Bras. Or., Argentina.]

Capsicum baccatum ?, Linn. Mant. i. p. 46.
Hab. Reperi ad Corumbá mens. Jan. (N. 948.)
Specimina nimis imperfecta, nondum fructifera. [Late diffusa.]

Nicotiana glauca, R. Grah. in Bot. Mag. sub tab. 2837.
Hab. Crescit juxta Corumbá, ubi mens. Jan. floret. (N. 965.) [Argentina, Uruguaria, Paraguaria.]
Frutex altus, vel etiam arbuscula trimetralis.
Possibly a garden escape, but thoroughly established near the eastern fort at Corumbá.

SCROPHULARIACEÆ.

Angelonia Gardneri, Hook. Bot. Mag. sub tab. 3754.
Hab. Florebat ad Coimbrá mens. Feb. (N. 1066.) [Bras. Or., Amazonia, Bolivia, Paraguaria.].

Conobea scrophularioides, Benth. in DC. Prod. x. p. 391.
Hab. Floret et Santa Cruz mens. Oct. (N. 484.) [Amer. Trop.]

Herpestis chamædryoides, H. B. K. Nov. Gen. et Sp. ii. p. 369.
Hab. Crescit juxta Santa Cruz, mens. Sept. florens. (Nn. 325, 355.) [Amer. Trop.]

Herpestis parvula (sp. nov.). Infraspithamea, debilis; caule erecto, capillari, quadrangulo; foliis exiguis, sessilibus, lineari-lanceolatis, obtusis, glabris vel obsolete puberulis; pedunculis capillaribus, minute puberulis, quam folia multo longioribus; floribus minimis; calycis puberuli lobis exterioribus lanceolatis, longe acuminatis, interioribus lineari-lanceolatis, quam exteriora paullo brevioribus; corollæ calycem fere duplo excedentis tubo superne gradatim ampliato, labio postico bilobo, lobis ovato-oblongis obtusis; antheris subdistantibus; stigmate bilobo.

Hab. Inveni in paludosis ad Campos de Tapirapuan mens. Sept. florentem. (N. 383.)

Radix deest. Caulis 16·0 cm. alt., subsimplex, leviter undulatus, gracillimus, minute puberulus, deinde glaber, intervallis 2·0–3·0 cm. foliigerus. Folia neque ultra 0·4 cm. long. et 0·1 cm. lat., marginibus crenulata, omnino sessilia. Flores purpurei. Calycis lobi extimi 0·3 cm. long.; lobi intermedii paullo breviores et angustiores,

intimi 0·25 cm. long. Corollæ tubus 0·4 cm. long., inferne 0·08 cm. lat., sub limbo 0·2 cm. lat.; lobi postici 0·1 cm. lat., lobi antici inter se subæquales, late ovati, obtusi, 0·13 cm. diam. Genitalia inclusa. Stamina fere $\frac{3}{5}$ a basi tubi inserta; filamenta glabra, complanata, staminum posticorum antheras circa duplo excedentia; anticorum antheris triplo longioribus; antheræ ellipticæ, 0·08 cm. long. Ovarium ovoideo-oblongum, obscure puberulum, 0·1 cm. long.; stylus complanatus, glaber, ovarium fere $3\frac{1}{2}$-plo excedens; stigmatis lobi abbreviati, subconoidei, circa 0·03 cm. long. Capsula vix matura subglobosa, calyce brevior, 0·2 cm. long., puberula.

Forsan juxta *Herpestem gracilem*, Benth., stirpem Mattogrossensem, interponenda, abhorret vero signis gravis momenti, scilicet staturâ humili, foliis minutis, calyce et corollâ disparibus, etc. [Matto Grosso.]

Herpestis acuta (sp. nov.); caule erecto, gracili, quadrangulari, ramoso, puberulo, ramulis ultimis fere capillaribus; foliis ultimis, solummodo visis, sessilibus, lanceolatis, acutis vel obtusis, integris serrulatisve, scabriusculo-puberulis; pedunculis gracillimis, sub flore ipso subito amplificatis, puberulis; bracteis subulato-setaceis, calyce multo minoribus; calycis lobis exterioribus late ovatis, breviter acuminatis, lobis interioribus lineari-lanceolatis, longe acuminatis; corollæ calycem duplo excedentis tubo inferne angusto, superne subito ampliato, labio superiore emarginato, lobis latis rotundatis, antheris subdistantibus, stigmate bilobo.

Hab. In ripâ fl. Cuyabá prope Melgaço inveni mens. Aug. florentem. (N. 8.)

Herba ? metralis, copiose ramosa. Folia inferiora desunt, suprema 0·8–1·5 cm. long., 0·2–0·35 cm. lat., firme membranacea. Pedunculi 0·5–0·7 cm. long., erecti, ascendentes. Fructus 0·1–0·2 cm. long. Flores purpurei. Calycis lobi exteriores 0·7–0·8 cm. long., sub flore vere modo 0·4 cm., scabriusculo-puberuli; lobus extimus latior et basi cordatus; lobi intimi 0·4 cm. long., pubescentes, marginibus hyalinis. Corollæ tubus circa 0·7 cm. long., inferne paullo ultra 0·1 cm. lat., superne ad 0·6 cm. dilatatus, extus et intus puberulus; labium posticum 0·35 cm. lat.; labii antici lobi ovati, 0·2 cm. lat. Genitalia inclusa. Stamina juxta medium corollæ inserta; filamenta glabra, staminum posticorum antheris duplo longiora, anticorum antheris 4-plo longiora; antheræ ellipticæ, posticæ paullo ultra 0·1 cm. long., anticis distincte majores. Ovarium ovoideo-oblongum, obsolete puberulum, 0·1 cm. long.; stylus complanatus, glaber, ovarium fere 4-plo excedens; stigmatis lobi incrassati, subspathulati, ovario paullo breviores. Capsula ignota.

Videtur juxta *H. angulatam*, Benth., interponenda, abs quâ, ob habitum graciliorem, folia diversiformia, flores longius pedicellatos, calycem majorem insigniter acuminatum, præter alia, stirps nostra primo obtutu secernenda.

Huic proxima exstat specimen in Paraguariâ a cl. Balansâ lectum, vix attamen conspecificum videtur scabritie partium et foliis amplexicaulibus, ovatis. serrato-dentatis, 2·0–2·5 cm. long., et pedunculis etiam longioribus (plerumque circa 1·0 cm.), et floribus majoribus, pedunculos æquantibus, flavido-roseis, necnon habitu validiore. (*H. paraguariensis*, nob., Balansa, N. 2142.) [Bras. Or., Paraguaria.]

HERPESTIS SERPYLLIFOLIA, Benth. in DC. Prodr. xi. p. 398.
Hab. Crescit ad Santa Cruz. (N. 355 *a*.) [Bras. Or., Paraguaria.]

SCOPARIA DULCIS, Linn. Sp. Pl. ed. I. p. 116.
Hab. Abundat ad Serra da Chapada, ad Santa Cruz, et alibi in provinciâ. (Nn. 88, 799.) [Late diffusa.]

SCOPARIA PINNATIFIDA, Cham. & Schlecht. in Linnæa, viii. p. 22.
Hab. Inveni in ripâ fl. Paraguay inter Villa Maria et Corumbá mens. Dec. (N. 847.) [Amazonia, Argentina, Paraguaria.]

BUCHNERA ROSEA, H. B. K. Nov. Gen. et Sp. ii. p. 342.
Hab. Incolit locos apertos juxta Santa Cruz, ubi floret mens. Sept. et Oct. (N. 334.) [Amer. Trop.]

BUCHNERA PALUSTRIS, Spreng. Syst. Veg. iii. p. 805.
Hab. Crescit in graminosis udis inter Cuyabá et Serra da Chapada, mens. Aug. florens. (N. 59.) [Bras. Or., Guiana, Peruvia.]

DESDEMONA, Scrophulariaceorum genus novum. (Pl. XXVII. figs. 2–9.)

Flores lateraliter zygomorphi. Calyx abbreviatus alte 5-partitus, segmentis ovatis, imbricatis, subæqualibus. Corollæ subcampanulatæ tubus subbrevis, latus, leviter incurvus; limbus suberectus, labio postico in anthesi intimo bilobo, labio antico 3-lobo, quam posticum longiore, lobis omnibus planis, oblongo-ovatis. Stamina 4, didynama, juxta basin corollæ inserta, inclusa; antherarum loculi divergentes, apice approximati, distincti; connectivus maxime incrassatus. Staminodium nullum. Discus inconspicuus. Stylus paullulum exsertus, apice stigmate parvo obtuso coronatus. Ovula in loculis bina, raro solitaria, fere ab apice pendula, anatropa; raphe ventralis, micropyle superior. Fructus et semina ignota.—Suffrutex humilis, perennis. Caulis e rhizomate crasso assurgens, erectus, crebre foliatus, simplex vel parce ramosus. Folia opposita et reverâ per paria decussate inserta, vel inferiora subopposita, raro plane alternantia, subintegra, membranacea, subsessilia. Pedicelli axillares vel terminales, abbreviati, bracteis parvis duabus instructi. Flores nutantes, parvuli.

DESDEMONA PULCHELLA (sp. nov.). Rhizoma corticatum, undulatum, interdum usque ad 0·5 cm. diam., sæpe vero tenuius, radices simplices, satis obesas, plagiotropicas vel orthotropicas passim emittens. Caulis gracilis, tetraqueter, glaber vel plurimum puberulus, 8·0–23·0 cm. alt., intervallis plerumque 1·0–3·0 cm. foliiger. Folia nunc ovato-oblonga, nunc oblongo-lanceolata, raro ovata, basi leviter coarctata, ibique raro paullo rotundata, apice sæpissime mucronata, marginibus breviter serrulatis, interdum undulatis; costæ secundariæ utrovis latere plerumque 4–5, infimæ

margine parallelæ, fere rectæ, superiores fornicate ascendentes, deinde undulatim conjunctæ, venulæ obscurissimæ, arcte reticulatæ. Pedunculi nutantes, puberuli, sursum ampliati, 0·2–0·3 cm. long. Bracteæ subulatæ, puberulæ, 0·15 cm. long. Flores albi, limbi lobi margine dilute citrini. Calyx totus 0·3 cm. long. et lat., subcampanulatus, puberulus; lobi acuti vel acuminati, ciliolato-fimbriolati, minute nervosi, 0·25 cm. long. Corolla in toto 0·8 cm. long., antice palato satis prominulo instructa, extus et intus minutissime pubescens; tubus 0·5 cm. lat., basi vero usque ad 0·3 cm. angustatus, limbi vix 0·7 cm. diam., labium posticum circa 0·3 lat.; labii antici lobi laterales 0·22 cm. lat., 0·18 cm. long., lobus anticus 0·15–0·2 cm. lat., 0·2–0·3 cm. long., lobi omnes obtusi vel leviter emarginati. Filamenta incrassata, complanata, basi parum curvata, puberula, longiora 0·3 cm., breviora paullo ultra 0·2 cm. long. Antheræ 0·2 cm. lat., puberulæ. Pollinis grana lævia, trigono-ellipsoidea, poris tribus induta. Ovarium ovoideo-oblongum, sursum attenuatum, glabrum, 0·08 cm. long. Stylus incurvus, complanatus, glaber, 0·4 cm. long.

The affinity of *Desdemona* is undoubtedly with *Scrophulariaceæ*; its habit, its æstivation, the bilabiate corolla, and the stamens all support this conclusion; but the placentation is highly remarkable. Solitary or binary ovules are rare in the order; according to Bentham, two-ovuled cells are found only in *Leptorhabdis*, *Melampyrum*, *Tozzia*, and a few species of *Veronica*, while *Tonella* may have one, two, or three ovules in its cells. In these cases, however, the ovule is fixed to the septum, not pendulous from the top of the cell, and in other respects all the above genera are markedly different from *Desdemona*. The general appearance at first suggested *Solanaceæ*, and there is a remarkable South-American genus, *Sclerophylax* of Miers, which that botanist himself, and it must be confessed not without reason, considered to be the type of a distinct order, which he proposed to call *Sclerophylaceæ*. The chief peculiarity of *Sclerophylax* lies in its possession of uniovulate ovarian cells, the ovules being pendulous from the top of the cell. This genus is placed in the 'Genera Plantarum' at the end of *Solanaceæ* with the remark—"Genus in ordine ab ovarii loculis 1-ovulatis valde anomalum, cætera tamen *Solanaceis* multo melius quam ulli alii ordini conveniunt." Precisely the same observation will apply to *Desdemona*, substituting "*Scrophulariaceis*" for "*Solanaceis*" of the just-quoted passage.

The habit of our plant is much that of the Brazilian *Ildefonsia*, though there are many points of difference between the two, *Ildefonsia* having a staminode and a bifid stigma, with normal placentation and a many-seeded capsule. Judging from appearances, the fruit of *Desdemona* is most probably baccate, as is the case with *Halleria* and a few other genera, of which *Leucocarpus* and *Dermatocalyx* alone are American; but the berry of both these is many-seeded.

Among *Solanaceæ*, the affinity of the present genus is closest with the *Salpiglossidæ*, the tribe which has repeatedly been bandied about from *Scrophulariaceæ* to *Solanaceæ* and back again; but of the plicate or induplicate or valvate æstivation of *Salpiglossidæ* I find no trace, and their placentation is entirely different. Moreover, except for its placentation, *Sclerophylax* has nothing in common with *Desdemona*. Any external

resemblance between the latter and *Solanaceæ* is therefore doubtless merely homoplastic.

The placentation is perhaps more that of *Myoporineæ* than of any other order either of the Personal or the Lamial Cohort—with the exception of *Selagineæ*, which are manifestly out of the question; but their shrubby habit, their æstivation, and anthers with confluent cells all conspire, irrespective of geographical considerations, to negative the supposition of a Myoporineous affinity for *Desdemona*. The discovery of an undoubted Myoporineous genus in South America, although by no means impossible, is yet so improbable that the affinity would not be admitted without very strong evidence being adduced in its favour, and of such evidence there is scarcely any in the present case.

The stem of this plant very early becomes woody, so that study of the arrangement of the vascular bundles is rendered difficult, and, with the scanty material at my command, quite impossible. The structure is worthy of notice in consequence of the almost entire localization of the sclerenchyme to the four angles, and the great reduction in the hard bast (Tab. XXXIX. fig. 1). A transverse section of a stem of one year's growth shows a normal girth often, at least in the case of dried material, ruptured in many places, narrow masses of xylem with relatively small tracheïdes, and very numerous thin medullary rays, with walls, under a low power, not easily distinguishable from the xylem. The phloëm, much less extensive than the xylem, consists of the usual elements, but these are very small; at its outer side are seen at intervals isolated bast-fibres, or more usually small groups of them. The cells of the cortex are thin-walled, except for the masses of sclerenchyme (*sc.*) already mentioned; there are also a very few scattered sclerotic parenchyme cells (*sp.*). The epidermal cells are pleated upon their outer wall—this pleating is, however, seen better when the leaf is examined, it being sufficient to detach a small piece of epiderm from either side of the leaf (fig. 5). Besides this there is little worth noting in the leaf-structure, except the great midrib with its large collenchyme cells (fig. 2), and the small glands sessile upon the upper surface; the latter emerge from small hollows, close around which on all sides are the epidermal cells (figs. 3 & 4). Stomata are found only upon the underside of the leaf.

GESNERACEÆ.

DRYMONIA (§ GENUINÆ) MACULATA (sp. nov.); caule scandente sat crasso, plus minus tetragono, nitido, radices adventivas debiles, parce fibrillosas emittente; foliis petiolatis, ovatis acutis vel obtusis, interdum breviter cuspidatis, basi plus minus angustatis, margine dentatis, coriaceo-membranaceis, supra scabriusculo-pubescentibus, subtus arcte tomentosis; floribus solitariis majusculis; calycis pubescentis lobis oblongo-ovatis, obtusis vel acutis, margine serrulatis, lobo postico plane minore; corollæ calycem circa duplo excedentis tubo postice saccato, limbi lobis ovatis fimbriatis posticis minoribus; disco postice prominulo, antice parvo; ovario ovoideo, tomentoso, stylo crassiusculo, pubescente, utrinque amplificato coronato.

Hab. In truncis arborum scandit ad Santa Cruz, ubi florere incipit mens. Nov. (N. 529.)

Caulis 0·5 cm. crass., ramulos angulo fere recto insertos sustinens; internodia brevia; cortex papyraceus, cervinus, longitrorsum rimosus; radices adventivæ 1·0–2·5 cm. long., capillares. Foliorum lamina 7·5–12·0 cm. long., 3·5–6·3 cm. lat.; costæ secundariæ subtus conspicuæ, utroque latere circa 7, oppositæ vel suboppositæ vel alternantes, aperte arcuatæ, sub margine conjunctæ; petioli 0·6–2·1 cm. long., sat validi, dense tomentosi. Pedicelli petiolis similes. Calyx vix 2·3–fere 3·0 cm. long., 2·0 cm. lat.; lobi majores basi levissime cordati, lobi postici non ultra 2·0 cm. long. Corolla alba puniceo-variegata, 3·5 cm. long., extus pubescens, imâ basi 1·0 cm. lat., mox ad 0·8 cm. angustata, hinc ad 1·3–1·5 cm. ampliata, ipso sub limbo iterum ad 1·0 cm. contracta; saccus 0·9 cm. long. et lat.; limbus circa 2·0 cm. diam., lobis circa 0·7 cm. long. Antheræ 0·65 cm. long. Ovarium 0·8 cm. long., 0·6 cm. lat., sensim paullo attenuatum; stylus circa 2·0 cm. long., complanatus; stigmatis lobi usque ad 0·3 cm. long. Fructus immaturus paullo ultra 1·0 cm. long. et lat., minute tomentosus.

Drymoniæ calcaratæ, Mart., arcte affinis, speciei mihi descript. et icon. solummodo notæ, abs quâ stirpem nostram foliis minoribus dentatis nec serrulatis, basi angustatis nec rotundatis vel oblique cordatis, pedunculis brevioribus, calycis minoris lobis basi minus oblique cordatis, corollæ minoris tubo sub limbo ipso manifeste contracto nullo negotio dijudicare potes. [Amazonia.]

Alloplectus (§ Erythranthus) sylvarum (sp. nov.); caule fistuloso, valido, tetragono, glabro, nitidissimo; foliis petiolatis, ovato-lanceolatis, utrinque acuminatis, apice cuspidatis, leviter undulato-repandis, firme membranaceis, sparsissime appresse puberulis; floribus solitariis (an semper?); pedunculis quam petioli circa 2-plo brevioribus, pubescentibus, basi a bracteis duabus parvis, inæqualibus, ovatis vel ovato-lanceolatis, extus puberulis instructis; calycis sparsissime puberuli lobis late ovatis, basi cordatis, apice acutiusculis, margine undulatis, lobis posticis insigniter minoribus; corollæ calycem $\frac{1}{2}$-plo excedentis tubo leviter ventricoso, recto, faucibus parum contracto, basi postice gibboso; filamentorum vaginâ corollæ tubo breviter adnatâ; antheris liberis, lineari-oblongis, sat elongatis, loculis contiguis; disco antice obsoleto; ovario ovoideo-oblongo, in stylum crassiusculum, complanatum, superne ampliatum desinente; stigmate late infundibulari.

Hab. Reperi in sylvâ primigeniâ inter Santa Cruz et Campos de Tapirapuan, mens. Sept. florentem. (N. 390.)

Frutex altus. Caulis 0·6 cm. diam., aliquanto geniculatus, parce ac grosse lenticelliferus; cortex laxus, tenuis, cervinus; internodia 5·0–7·0 cm. long. Foliorum penninervium lamina subtus pallida, vulgo 10·0–16·5 cm. long., 3·5–5·0 cm. lat., basi nec ultra 0·3 cm. lat.; acumen 2·0 cm. long.; costæ secundariæ utroque latere 5–7, alternantes, aperte arcuatæ; petioli 2·0–4·0 cm. long., basi ampliati, puberuli. Pedunculi puberuli, 1·0–1·5 cm. long.; bracteæ 0·5–0·8 cm., verisimiliter virides. Calyx tempore florendi 3·0 cm. long., paullo post anthesin fere usque ad 4·0 cm. auctus; lobi basi oblique cordati, lobi postici vix usque ad 2·0 cm. long., 0·8 cm. lat., lobi majores ad 1·3 cm. lat., tenuiter membranaceæ, nervosæ, vivæ sanguineæ. Corolla lutea, extus pubescens, in toto circa 4·0 cm. long., tubus

basi 0·6 cm. diam., medio 1·0 cm., et sub faucibus ad 0·8 imminutus; limbus circa 1·7 cm. diam. Filamentorum vagina, more generis postice fissa, 0·6 cm., corollæ adnata; antheræ 0·7 cm. long., loculo altero sæpe paullo altius affixo. Ovarium minute tomentosum, 0·6 cm. long., superne sensim coarctatum; stylus puberulus, tempore florendi 2·5 cm. long., sub stigmate usque ad 0·2 cm. dilatatus; stigma 0·25 cm. diam. Fructus immaturus ovoideo-oblongus, minute pubescens, vix 1·5 cm. long. et 1·0 cm. lat.

Species distinctissima, ob flores parvibracteatos et calycis lobos amplos coccineos primo obtutu cognoscenda. *Alloplectum sparsiflorum*, Mart., aliquatenus simulat, sed bracteis magnis sanguineis stirpis illius omnino caret. Forte proxima *A. coriaceo*, Hanst., plantæ Costaricensi.

BIGNONIACEÆ.

Bignonia (Arrabidea, sensu Candolleano) rubescens (sp. nov.). Scandens, crebre ramosa, ramulis sat gracilibus, teretibus, nitidis, striatis, minute puberulis; foliis petiolatis, 2- raro 3-foliolatis, foliolis petiolulatis, late ovatis obtusis, breviter cuspidatis, basi rotundatis, nonnunquam obscure cordatis, coriaceis, arcte reticulato-nervosis, obsolete puberulis, siccitate rubescentibus, costis secundariis 4–6 distantibus, raro suboppositis, plus minus arcuatis; paniculis terminalibus, multifloris, folia multo excedentibus, tomento perbrevi incano, quasi pruinâ, obtectis, cito minute puberulis; floribus parvis, in pedicellis brevibus albido-tomentellis insidentibus, calycis tubulosi ore recto obscure 5-fido, dense albide vel roseolo-tomentoso; corollæ calycem 5-plo excedentis tubo subrecto, superne ampliato; limbo subdistincte bilabiato; labii postici lobis anticis manifeste minoribus, labio antico 3-partito; staminibus brevissime exsertis; antherarum loculis anguste linearibus, quam maxime divaricatis; disco elevato, incrassato, breviter cupulari, ovarium brevissime stipitatum, anguste lineare, superne coarctatum, semi-æquante, ovulis biseriatis.

Hab. Inveni ad Santa Cruz, ubi flores decoros mens. Nov. ostendit. (N. 663.)

Ramuli 2·5–3·5 cm. diam., ad nodos leviter tumidi. Petioli foliolis dimidio breviores vel ea subæquantes, patentes, subteretes, stricti, una cum petiolis non ultra 2·3 cm. long., in sicco nitescentibus; foliola plerumque 7·0–8·0 cm. long. et 4·5-6·0 cm. lat., basi paullo obliqua, crebre minutissime pellucido-punctata, in paginâ utrâvis (præsertim vero supra) nitida, folium terminale lateralia subæquans, sed duplo longius petiolulatum. Paniculæ usque ad 30·0 cm. long., validæ, intervallis plerumque 3·0–5·0 cm. long., ramulos florigeros albide tomentosos, nonnunquam ex axillis foliorum in cirrhos simplices mutatorum ortos, proferentes. Pedicelli usque ad 0·65 cm. long., plerique minus longi. Flores lilacini. Calyx 0·3–0·4 cm. long., 0·3–0·35 cm. lat., intus minutissime puberulus. Corollæ tubus vix 2·0 cm. long., basi 0·25 cm., sub limbo 0·6 cm. diam.; limbi lobi oblongo-ovati, obtusissimi, fere 0·5 cm. long.; labii postici lobi 0·3 cm. long. Filamenta 0·3 cm. supra basin tubi inserta, imâ basi pubescentia, ceteroquin glabra, complanata; antherarum loculi glabri, 0·24 cm. long. Discus fere 0·15 cm. alt., paullo ultra 0·1 cm. diam. Ovarium minutissime puberulum, vix 0·3 cm. alt., 0·05 cm. diam.; stylus 1·3 cm. long.; stigmatis lobi oblongi, 0·1 cm. long. Capsula ignota.

Nulli affinis, nisi specimini Pohliano (n. 1784) in Herb. Kew. asserv. et certe errore "*Arrabidea rosea*" denominato. Ab *A. roseâ*, DC., sat discrepat, ut ex icone Delessertiano patet, foliolorum formâ, calyce amplo nec turbinato, aliisque signis. Habitum et folia spec. Pohliani supra citati planta nostra præbet (foliolis minus acuminatis, plerumque minoribus, vix rubescentibus exemptis), sed ob calyces suos minores et corollas diversas et fere $\frac{1}{3}$ breviores vix conspecificæ videntur. [Bras. Or.]

BIGNONIA (ARRABIDEA, sensu Candolleano) TOMENTELLA (sp. nov.); ramis junioribus, petiolis, foliolorum paginâ inferiore, inflorescentiæ axibus arcte albido-tomentosis; foliis bifoliolatis vel trifoliolatis, petiolo raro in cirrhum brevem simplicem excurrente, foliolis ovatis obtusis, interdum brevissime cuspidatis, basi nunc rotundatis, nunc sensim coarctatis, pag. sup. mox pubescentibus ibique nitescentibus; petiolulis foliolorum imparium petiolo plerumque duplo brevioribus, foliolorum lateralium petiolo duplo vel triplo brevioribus, nonnunquam subæquilongis; paniculis terminalibus, copiose ramosis, plurifloris, quam folia longioribus; pedicellis abbreviatis; calycis late tubulosi ore recto, leviter denticulato vel truncato, dense subroseolo-tomentoso; corollæ calycem 6-plo superantis tubo fere recto, basi angusto, superne ampliato, limbo subbilabiato; staminibus brevissime exsertis; antherarum loculis maxime divaricatis, angustissimis; disco elevato, cupulari, ovarium oblongum circa semiæquante, ovulis 2-seriatis.

Hab. Juxta Corumbá mens. Jan. florescit. (N. 1035.) Itaque in Brasiliâ Orientali a cl. Glaziou lecta. (N. 11229 in Herb. Kew.)

Rami sat validi, teretes, dein glabri et cortice cervino crebre striato lenticellifero obtecti. Foliola 4·5–7·0 cm. long., 3·0–4·0 cm. lat. (imparia paullo majora); costæ secundariæ utroque latere 4–6, distanter insertæ, inferioribus exemptis raro suboppositæ, inferiores fere rectæ, superiores arcuatæ; petioli vix usque ad 3·0 cm. long., plerumque vero minores, ascendentes. Paniculæ ad 9·0 cm. long., intervallis 1·0–2·5 cm. ramuligeræ. Pedicelli circa 0·2 cm. long. Calyx 0·3 cm. long., 0·25 cm. lat. Corolla circa 1·7 cm. long., purpurea, ferrugineo-tomentella, tubus 1·3 cm. long., basi 0·15 cm., sub limbo 0·6 cm. lat., intus superne puberulus ceterum glaber; lobi intus pubescentes. Filamenta 0·35 cm. supra basin corollæ affixa, basi pilosa, alibi glabra; antherarum loculi 0·18 cm. long. Discus 0·8 cm. alt. Ovarium vix 1·5 cm. alt., dense tomentellum; stylus fere omnino glaber, 1·0 cm. long.; stigma infundibulare, 0·03 cm. diam.

Præcedenti affinis, sed indumento ac foliolis diversiformibus, præter plura alia, facili negotio distinguenda. [Bras. Or.]

BIGNONIA (ARRABIDEA, sensu Candolleano) GREWIOIDES (sp. nov.). Fruticosa, diffusa, ramis validis pubescentibus, proventu glabris, cortice cinereo manifeste striato, crebre lenticellifero obductis; foliis petiolatis, mediocribus, ecirrhosis, plerisque unifoliolatis, paucis superioribus bifoliolatis, foliolis ovatis vel late ovato-lanceolatis, breviter cuspidatis, obtusis, obscure mucronulatis, deorsum rotundatis vel sensim angustatis, margine undulatis, minutissime pulvereo-pubescentibus, dein fere glabris; paniculis axillaribus terminalibusve, plerumque foliis brevioribus, anguste thyrsoideis, plerisque

circa 20–30-floris, fulvo-tomentosis; floribus parvis subsessilibus; bracteis lanceolatis, fulvo-tomentosis, pedicellos excedentibus; calyce campanulato, ore recto, breviter et subæqualiter 5-dentato, fulvo-tomentoso; corollæ tubo calycem forte circa 2-plo excedente a basi gradatim amplificato; limbo sub-bilabiato; antherarum loculis divaricatis, oblongis; disco amplo cupulari, leviter incrassato, aliquatenus abbreviato; ovario anguste oblongo-lineari, arcte tomentello, paullulum ante anthesin discum breviter superante; ovulis uniseriatis.

Hab. Legi in viâ inter Corumbá et Ladario mens. Jan. florescentem et fructus immaturos proferentem. (N. 1028.)

Frutex trimetralis, abunde ramosus. Ramuli paniculiferi ad 0·3 cm. diam., fere recti, in nodis parum tumidi, internodia inæquilonga, nunc 1·0, nunc 4·0 vel 5·0 cm. long.; lenticelli parvi, punctiformes, eminentes. Foliola majora 8·0–11·0 cm. long., et 4·0–6·0 cm. lat., firme membranacea, subtus pallentia; costæ secundariæ 6–8, angulis variis insertæ, rectæ vel leviter arcuatæ, interdum insigniter bicruræ; venæ conspicuæ, rectæ vel undulatæ; petioli ascendentes, 0·7–2·0 cm. long., sæpe sursum et deorsum incrassati, minute pubescentes, demum glabri. Paniculæ 5·0–6·0 cm. long., ascendentes. Bracteæ plerumque 0·2–1·0 cm. long., acutæ. Calyx 0·4 cm. long., vix 0·3 cm. lat.; lobi 1·0 cm. long. Corollam albam expansam frustra quæsivi, forsan long. circa 0·8 cm. attingat; tubus intus hinc atque illinc puberulus; lobi intus tomentelli. Filamenta basi pilosa, ceterum glabra; antherarum glabrarum loculi 0·1 cm. long. Discus 0·04 cm. alt. Ovarium paullulum ante anthesin 0·1 cm. long.; stylus glaber, complanatus; stigma infundibulare, parvum. Capsulæ vix maturæ exstant ad 4·5 cm. long., et 0·15–0·2 cm. lat., rectæ vel plus minus curvatæ, minute tomentellæ, calyce nondum exserto primo basi cinctæ.

Non dubito quin juxta *Bignoniam Claussenii* (*Arrabideam Claussenii*, DC.) inserenda sit, cujus folia iis stirpis nostræ sat similia, nisi minora et semper simplicia, sed inflorescentia et flores et fructus longe alieni. *Arrabidea? platyphylla*, DC., a nobis non visa, foliis maximis semper simplicibus, basi 3–5-nervibus, paniculis terminalibus ramosissimis, calyce minutissime denticulato, etc., gaudet. [Bras. Or.]

The periodicity in the flowering and fruiting of this plant is noteworthy, for whereas young capsules were abundant, and multitudes of buds in various stages could be seen, I could not find a single expanded flower, and this was not a case of cleistogamy.

Bignonia (Clematitaria, sensu Bureaviano) melioides (sp. nov.). Scandens, glabra, caule acute 4-angulari, vix 4-alato; foliis, petiolis patentibus fultis, membranaceis, unijugis, jugis biternatis, segmentis imparibus, ovato-lanceolatis, breviter cuspidato-acuminatis, basi rotundatis vel leviter angustatis; petiolo in cirrhum gracilem, elongatum, apice 2–3-fidum excurrente; stipulis magnis, rotundato-obovatis, basi leviter cordatis, amplexicaulibus, obtusissimis; racemis laxis, gracilibus, paucifloris, æquilongis; bracteis exiguis, subulatis; floribus mediocribus, longipedicellatis; calyce tubuloso mediocriter elongato, puberulo, ore obscure denticulato, breviter albo-ciliato; corollæ calycem 7-plo excedentis tubo basi angusto, mox sensim ampliato; limbi sub-bilabiati lobis oblongo-ovatis obtusis; staminibus inclusis; antherarum

loculis divaricatis oblongo-linearibus; disco cupulari, incrassato, quam ovarium puberulum duplo breviore; ovulis pleiostichis.

Hab. Reperi juxta Santa Cruz vigentem, et mens. Oct. florentem. (N. 406.)

Caulis 2·3 cm. diam., internodia elongata (15·0–18·0 cm. long.). Folia (petiolo comprehenso) circa 13·0 cm. long.; petiolus solus 3·5–4·5 cm.; segmenta ultima 2·0–6·0 cm. long., 1·2–3·0 cm. lat., segmenta imparia lateralibus semper majora, reticulato-nervosa, nitida, subtus pallidiora; cirrhus circa 10·0 cm. long., sursum attenuatus, circa 1·0 cm. apice divisus; stipulæ 1·0 cm. long., 1·5 cm. lat., membranaceæ, reticulato-nervosæ. Racemi ad 13·0 cm. long., 8- vel pluri-flori; bracteæ 0·1–0·3 cm. long. Pedicelli sub flore subito ampliati, 1·5–2·0 cm. long. Calyx 0·8 cm. long., sursum vix 0·5 cm. lat. Corollæ puberulæ, albæ, tubus pallide viridis, 5·0 cm. long., deorsum 0·2–0·3 cm., sursum 2·5 cm. lat., juxta staminum insertionem pubescens, ceteroquin puberulus; limbi fere 3·5 cm. diam., lobi 1·0 cm. long., intus minute pubescentes. Filamenta 1·2 cm. supra basin corollæ inserta, glabra; antherarum glabrarum loculi vix 0·3 cm. long. Staminodium 0·5 cm. long., superne pilosum, apice capitellatum. Discus paullo ultra 0·1 cm. alt., 0·25 cm. diam. Ovarium vix 0·25 cm. long., 0·08 cm. lat.; stylus 2·5 cm. long., complanatus, glaber; stigma infundibulare, 0·15 cm. long., vix 0·1 cm. diam. Capsula ignota.

Affinis *Bignoniæ tetragonocaulæ*, DC., et *B. jasminifoliæ*, H. B. K., ab ambabus vero abhorret, præter alia, foliolis disparibus et racemis comparate elongatis. [Amazonia, Venezuela.]

BIGNONIA (§ CONJUGATÆ) CAUDIGERA (sp. nov.). Scandens, caule validiusculo, subterete, primo puberulo, mox glabro et refulgente; foliis petiolatis bifoliolatis, foliolis late ovatis, basi rotundatis ibique leviter cordatis, apice caudato-cuspidatis, mucronatis, tenuiter coriaceis, glaberrimis, petiolo interdum in cirrhum brevem producto; paniculis axillaribus terminalibusve folia subæquantibus vel ea paullo excedentibus, minute pubescentibus; bracteis exiguis; pedicellis quam calyces brevioribus, minute pubescentibus; calyce anguste tubuloso, arcte fusco-tomentello, ore obliquo 5-dentato, uno latere breviter fisso; corollæ calycem 3-plo excedentis tubo triente inferiore cylindraceo, hinc subito ampliato; limbi sub-bilabiati lobis ovatis obtusissimis; staminibus inclusis; disco abbreviato, paullo incrassato, cupulari, ab ovario cylindraceo tomentello $2\frac{1}{2}$-plo superato; ovulis sub-biseriatis.

Hab. Crescit juxta Corumbá, ubi mens. Jan. florescit. (N. 971.)

Caulis 2·5–3·0 cm. diam., longitrorsum arcte striatus, lenticellis parvis punctiformibus conspersus. Foliola 8·0–9·5 cm. long., 4·5–5·5 cm. lat., parum obliqua, leviter undulata, impunctata, in sicco nigrescentia, utrinque fulgentia; costæ secundariæ utrovis latere 5–6, raro suboppositæ, aperte arcuatæ vel fere rectæ, venis (præsertim fac. sup.) eminentibus, plane reticulatis; petioli 1·0–1·5 cm. long., patentes, petiolulos graciliores subæquantes; cirrhi non ultra 4·0 cm. long., simplices. Paniculæ pluriflorae, ad 10·0 cm. long. Bracteæ subulatæ, minute pubescentes, $\pm$0·2 cm. long. Flores purpurei. Calyx vix 1·0 cm. long., 0·3 cm. lat., usque ad $\frac{1}{4}$ solummodo uno latere fissus; dentes erecti, angustissimi, 0·07 cm. long. Corolla

1·5 cm. long., basi 0·2 cm., sub limbo 0·5 cm. lat., extus superne tomentella, intus faucibus et limbi lobis tomentella, alibi summum puberula. Filamenta, 0·45 cm. supra basin corollæ inserta, basi pilosa; antheræ 0·2 cm. long. Discus 0·1 cm. alt. Ovarium 0·25 cm. long. et 0·08 cm. lat.; stylus teres, crassiusculus, glaber, 0·7 cm. long.; stigma elongatum, gracile, 0·25 cm. long.

Speciei nullæ mihi cognitæ affinis, et reverâ foliolis nigrescentibus, caudato-acuminatis, basi rotundato-cordatis, et floribus comparative parvis et calycis dentibus prominulis haud difficiliter dignoscenda.

BIGNONIA (§ CONJUGATÆ) MODESTA (sp. nov.). Fruticosa, ramis teretibus, gracilibus, fusco-tomentosis, dein arcte pubescentibus; foliis petiolatis, bifoliolatis vel trifoliolatis, foliolis parvis lanceolatis acuminatis, raro obtusis, basi obliquis, obtusis, margine repandis vel repando-dentatis, membranaceis, subtus in nervis minute rufo-tomentosis, dein ibi pubescentibus; flore unico nobis obvio terminali, pedunculo rufo-tomentoso, basi biglanduloso, petiolo breviore fulto; calycis tubulosi, tomentosi, ore breviter ac impariter 5-lobo; corollæ calycem $3\frac{1}{2}$-plo excedentis tubo inferne angustissimo, superne gradatim dilatato; staminibus inclusis; antherarum loculis maxime divaricatis, oblongis, puberulis; disco crassiusculo, quam ovarium oblongum multo breviore.

Hab. Reperi in sylvâ primævâ florentem juxta Santa Cruz mens. Sept. (N. 338.)

Ramuli foliigeri 0·1 cm. diam., ad nodos aliquanto tumidos glanduliferi, internodia 4·0–7·0 cm. long. Foliola 3·3–5·5 cm. long., 0·8–1·4 cm. lat., foliolum terminale plerumque paullo majus et longius petiolulatum, foliola omnia creberrime pellucido-punctata; costæ secundariæ utroque 4–5, raro suboppositæ, inferiores fere rectæ, superiores leviter arcuatæ; petioli 1·2–1·5 cm. long., petiolulos laterales 3-plo excedentes et terminalem subæquantes, omnes rufo-tomentosi. Pedunculus 0·6 cm. long. Calyx vix 1·0 cm. long., medio fere 0·4 cm. lat.; lobi perbreves, rotundati, 0·1 cm. long. Corolla pallide purpurea, 3·5 cm. long., 0·9 cm. diam., deorsum modo 0·1 cm. lat., sub limbo 0·7 cm., extus tomentella, basi glabra. Filamenta, 1·0 cm. supra basin tubi corollæ inserta, inferne puberula; antheræ 0·22 cm. long. Staminodium circa 0·2 cm. long., apice capitellatum. Discus 0·07 cm. alt. Ovarium 0·25 cm. long., tomentellum; stylus glaber. Capsula ignota.

Species elegans, foliolis parvis, lanceolatis acuminatis, corollâ mediocri, inferne maxime attenuatâ, congeneribus ab omnibus distinctissima.

Huic generi referendæ, sed nimis mancæ, exstant insequentes:

i. BIGNONIA, sp. Ramulis fulvo-tomentosis, demum glabris; foliis bifoliolatis, petiolatis, foliolis supra nitidis, subtus velutinis, ovatis, breviter acuminatis, 6·0–9·5 cm. long.; capsulis 10·0 cm. long., 3·5 cm. lat., pedunculo valido insidentibus; seminibus circa 4·5 cm. lat., nucleo paullo ultra 1·0 cm. diam. Flores desunt.

Hab. Crescit ad Serra da Chapada, ubi inveni mens. Aug. (N. 95.)

ii. BIGNONIA, sp. Habitu *B. Unguis*, Linn., foliolis lanceolatis vel ovato-lanceolatis, 4·5–6·0 cm. long., 1·8–2·5 cm. lat., utrinque obtusis, apice breviter apiculatis. Nec flores nec fructus suppetebant.

Hab. Reperi ad Jangada mens. Sept. (N. 278 *a*.)

MACFADYENA LAURIFOLIA, Miers, in Proc. Hort. Soc. 1863, p. 200 (ex descr.). (*Spathodia laurifolia*, H. B. K.).

Hab. Flores dilute puniceos ostendit mens. Jan. in ripâ fl. Paraguay ad Carandajinho, inter Corumbá et Dorados. (N. 1018.)

I have seen no authentic specimens of this species, and so can only rely for this identification upon Kunth's description (Nov. Gen. et Sp. iii. p. 146). The four species *M. Coito*, Miers, *M. platypoda*, Miers, *M. corymbosa*, Griseb., and *M. laurifolia*, Miers, are evidently very closely allied. The first of these has, however, a calyx straight to the tip; the pedicels of *M. platypoda* are winged, while acuminate leaves subcordate at the base are characteristic of *M. corymbosa*. Our plant, with the recurved calyx-tip of *M. corymbosa* and *M. laurifolia*, has leaves which exactly agree with the description given of those of the latter species. [Venezuela.]

MACFADYENA RIPARIA (sp. nov.); caule gracili ascendente, ad nodos tumido, minute puberulo, mox glabro et cortice leucophæo eximie striato cincto; foliis plerisque simplicibus, supremis tantummodo bifoliolatis, brevipetiolatis, late ovatis, utrinque obtusis vel obtusissimis, coriaceo-membranaceis, glabris; inflorescentiæ axi terminali paucifloro, ramulis anguste alatis, minute puberulis; floribus mediocribus, pedicellis brevibus erectis sub flore obesis insidentibus; calyce amplo, membranaceo, paullo ultra $\frac{1}{2}$ spathaceo-fisso, apice incrassato, recto; corollâ tubæformi superne gradatim ampliatâ; limbi lobis late ovatis obtusis; staminibus inclusis; disco abbreviato, quam ovarium oblongum puberulum multoties breviore; ovulis uniseriatis.

Hab. Crescit in ripâ fl. Paraguay, inter Santa Cruz et Villa Maria, mens. Dec. (N. 837.)

Caulis vix semimetralis rhizomate crasso ortus, 2·0–2·5 cm. diam., striatus; internodia usque ad 10·0 cm. long., suprema abbreviata. Foliorum subnitidorum juga nunc parva, nunc grandiora; petioli 0·5–1·2 cm. long., utrinque incrassati; lamina foliorum majorum 8·5–9·0 cm. long. et 4·5–6·0 cm. lat., foliorum minorum 5·5–7·0 cm. long. et 2·7–4·5 cm. lat., foliorum bifoliolatorum foliola ad 5·0 cm. long. et 2·7 cm. lat., et petiolulis 0·4 cm. fulta; omnium costa media supra impressa, subtus eminens; costæ secundariæ utrinque 4–6, rectæ vel leviter curvatæ, marginem versus arcuatim et undulatim conjunctæ. Inflorescentia speciminis unici meos ante oculos biflora, folia subæquans; pedicelli 0·7–0·8 cm. long. Calyx 2·3 cm. long., puberulus, longitrorsum crebre nervosissimus. Corollæ puberulæ, 5·0 cm. long., ut opinor purpureæ, tubus paullo supra calycem 0·7 cm. lat., sub limbo circa 2·0 cm.; limbus 3·0 cm. diam. Filamenta 0·8 cm. supra basin corollæ fixa, glabra; antheræ lineari-oblongæ, glabræ, vix 0·4 cm. long. Ovarium 0·35 cm. long., 0·15 cm. lat.; stylus complanatus, puberulus, 2·7 cm. long.; stigma spathulato-infundibulare, 0·3 cm. long., 0·15 cm. lat. Capsulæ non suppetebant.

Ex affinitate *M. Coito*, Miers, *M. platypodæ*, Miers, *M. corymbosæ*, Griseb., et *M. laurifoliæ*, Miers, a quibus foliis maximâ pro parte simplicibus primo visu distinguenda. [Bras. Or., Venezuela, Ind. Occ.]

MACFADYENA BIPINNATA (sp. nov.). Fruticosa, erecta, caule haud volubili, terete, minute fulvo-tomentoso, dein glabro vel fere glabro et nitido; foliis magnis, longipetiolatis, supremis simpliciter 2–3-jugim imparipinnatis, petiolulatis, inferiorum jugis proximis trifoliolatis, foliolis petiolulatis, oblongo-ovatis, obtusis, deorsum subito coarctatis, ibique plus minus obliquis, margine revolutis, penninervibus, coriaceis, velutino-tomentosis, supra metallicis, subtus subfulvis; inflorescentiâ axillari vel terminali; paniculis angustis, racemiformibus, in sicco nigricantibus, flores mediocres pedicellatos, plerumque oppositos gerentibus; pedicellis bracteas oppositas, multo breviores, ovatas vel lanceolatas, puberulas, ad medium gerentibus; calyce tubuloso-campanulari primo clauso per anthesin vix usque medium spathaceo-fisso, ore breviter et impariter lobulato; corollæ calycem circa $2\frac{1}{2}$-plo excedentis tubo basi satis lato mox subito amplificato; limbi lobis ovatis obtusis; staminibus verisimiliter inclusis, antheris divaricatis, disco quam ovarium oblongum insigniter breviore; ovulis uniseriatis.

Hab. Inveni ad Santa Cruz mens. Sept. florescentem. (N. 290.)

Caulis 0·2–0·3 cm. diam., longitrorsum striatulus, lenticellis parvis auctus. Folia (petiolo excluso) 18·0–20·0 cm., suprema 10 cm. long.; foliola impunctata 3·5–6·5 cm. long., 1·5–3·2 cm. lat.; costæ secundariæ utrinque 6–8, basales approximate oblique vel aperte arcuatæ, eæ lateris unius plerumque magis eminentes; petioli 7·0–9·0 cm. long. (fol. summorum 4·5 cm.), teretes, velutini, basi pulvinati, conspicue biglanduliferi, petioluli velutini, nunc elongati (3·5–4·0 cm. long.), nunc ad 0·2 cm. abbreviati. Paniculæ ad 12·0 cm. long.; pedicelli ascendentes, foliorum inferiorum ad 1·8 cm. long., superiorum breviores; bracteæ 0·2–0·25 cm. long., in sicco nigricantes. Calyx 1·3 cm. long., 0·5 cm. lat., usque ad 0·6 cm. spathaceo-fissus, puberulus. Corolla lutea, verisimiliter circa 4·0 cm. long., extus puberula. Filamenta 0·9 cm. supra corollæ basin inserta, glabra, antherarum loculi 0·35 cm. long., glabri. Discus 0·04 cm. alt.; ovarium 0·3 cm. long., glabrum; stylus complanatus circa 3·0 cm. long., stigma infundibulare circa 0·15 cm. long. et 0·1 cm. diam. Capsula ignota.

Sine ullâ dubitatione ad *M. fallacem* (*Bignoniam fallacem*, Cham.) spectat, cujus folia sat similia nisi minora, flores vero longe alieni. [Bras. Or.]

MACFADYENA PUBESCENS (sp. nov.). Scandens, caulibus gracilibus, hâc atque illâc geniculatis, subteretibus; ramulis ultimis arcte tomentosis, deinde glabris; foliis pro genere parvis, breviter petiolatis, bifoliolatis, petiolo haud producto vel in cirrhum brevem apice trifidum excurrente, vel ab apiculo pusillo nunc integro, nunc 2–3-fido coronato, foliolis lanceolatis vel ovato-oblanceolatis, obtusis vel obtusissimis, basi gradatim coarctatis, utrinque tomentellis, demum pubescentibus, membranaceis; pedunculis axillaribus, quam folia multoties brevioribus, oppositis, unifloris, tomentellis; bracteis exiguis lanceolatis vel linearibus, acuminatis, juxta medium pedunculum insertis, pubescentibus; calyce sat abbreviato late tubuloso, usque ad medium fisso, ore undulato vel impariter lobulato, apice haud incrassato; corollæ tubo elongato, deorsum coarctato, inde sensim amplificato, extus et intus sursum puberulo; limbi lobis late ovatis, obtusis; staminibus inclusis; disco maxime incrassato, abbreviato, ter latiore quam longo, ovario cylindraceo, puberulo, multo breviore; ovulis uniseriatis.

Hab. Viget in ripâ fl. Paraguay, inter Villa Maria et Corumbá, ubi reperi mens. Dec. florentem. (N. 1021.)

Caulis 2·0–3·0 cm. diam., lenticellis eminentibus passim obtectus. Foliola impunctata, pleraque 3·0–5·0 cm. long. et 1·5–3·0 cm. lat., apice nonnunquam apiculata; costæ secundariæ utroque latere circa 6, nunc approximatæ, nunc distantes, fere rectæ, marginem versus subito arcuatæ, venulis obsoletis laxe reticulatis; petioli ad 1·2 cm. long., plerumque vero breviores; petioluli nulli ultra 0·5 cm. long. (plerique 0·2–0·3 cm.). Pedunculi vix unquam ad 1·0 cm. long., erecti; bracteæ 0·2–0·5 cm. long. Calyx 1·2 cm. long., 0·8 cm. lat., præsertim inferne pubescens. Corolla lutea, 6·5–7·0 cm. long., paullo supra basin 0·4 cm. lat., sursum 1·5 cm.; limbus extus fere omnino glaber, 3·5 cm. diam. Filamenta circa 1·0 cm. supra basin corollæ affixa, basi puberula, ceterum glabra; antheræ oblongæ, puberulæ, 0·3 cm. long. Discus 0·35 cm. lat., 0·12 cm. alt. Ovarium 0·3 cm. long., 0·08 cm. lat.; stylus subteres, fere glaber, 3·5 cm. long.; stigma spathulato-infundibulare, 0·35 cm. long. Capsula ignota.

Species distinctissima, nulli affinis, et foliis pro genere parvis pubescentibus illico agnoscenda.

Saldanhæa lateriflora, Bur. in Adansonia, viii. p. 355.

Hab. Juxta Santa Cruz viget et mens. Sept. flores purpureos ostendit. (N. 353.) [Bras. Or., Goyaz.]

Adenocalymna croceum (sp. nov.). Scandens, caule sat crasso, subterete, glabro, deinde cortice subfusco, nitido, striato, lenticellifero obtecto; foliis amplis, petiolatis, bifoliolatis, plerisque absque cirrho paucis longe ac simpliciter cirrhosis; foliolis late ovatis obtusis vel leviter emarginatis, basi paullo cordatis, eximie reticulato-nervosis, membranaceo-coriaceis, supra nitidis, vetustioribus in sicco subnigricantibus; racemis axillaribus vel terminalibus, folia majora subæquantibus, plurifloris; floribus mediocribus breviter pedicellatis, in sicco nigricantibus; bracteis parvis, obovatis, caducis; calyce alte cyathiformi, obsolete dentato, pedicellos excedente vel subæquante, glandulifero; corollæ calycem 4-plo excedentis tubo sursum sensim ampliato, sub limbo parum contracto; limbi lobis late obovatis obtusis; staminibus inclusis; disco brevi, carnosulo, quam ovarium lineari-oblongum multo breviore; ovulis biseriatis.

Hab. Crescit in sylvestribus juxta Corumbá, ubi florescit mens. Jan. (N. 980.)

Caulis ad 0·5 cm. diam., lenticellis punctiformibus adspersus. Foliola majora usque ad 13·0 cm. long. et 8·5 cm. lat., minora 6·0–1·0 cm. long. et 2·5–4·3 cm. lat., margine revoluta, subtus decoloria, minute et angustissime elliptica, pellucido-punctata; costæ secundariæ utrovis latere 6–8, inferiores distantes, angulis variis insertæ; venulis arcte reticulatis utrinque prominulis; petioli ad 2·0 cm. long., patentes, teretes, striatuli; petioluli petiolos subæquantes vel iis longiores brevioresve. Racemi puberuli, cito glabri, ad 11·0 cm. long.; pedicelli evoluti 0·5–1·0 cm. long. Bracteæ 0·1–0·15 cm. long., ciliolatæ. Flores crocei. Calyx 1·0 cm. long., circiter 0·6 cm. lat., carnosulus, scabriusculo-puberulus. Corolla extus minute pubescens,

4·0 cm. long.; tubus medio 0·8 cm. lat., limbus 2·5 cm. diam. Filamenta 0·8 cm. supra basin corollæ fixa, obsolete puberula; antheræ oblongæ, 0·3 cm. long., puberulæ. Discus 0·1 cm. alt. Ovarium 0·35 cm. long.; stylus complanatus, puberulus, vix 2·5 cm. long.; stigma bilobum, lobis oblongis, obtusis, vix 0·3 cm. long. attingentibus. De capsulâ inquirendum.

Videtur accedere ad *Adenocalymna nitidum*, Mart., sed foliis bifoliolatis comparative latioribus, racemis glabris, interdum vere terminalibus, folia subæquantibus, calyce obsolete dentato, bracteas longe superante, primo intuitu indubitate pro specie propriâ habendum. [Bras. Or.]

ANEMOPÆGMA BREVIPES (sp. nov.). Scandens, ramis teretibus, arcte striatis, fulvo-hirsuto-tomentosis, mox pubescentibus, dein glabris; foliis breviter petiolatis, bifoliolatis, plerumque ecirrhosis, petiolo in cirrhum brevem interdum excurrente, nonnunquam brevissime ultra foliolorum insertionen producto; foliolis mediocribus, breviter petiolulatis, ovatis, plerumque acutis vel breviter cuspidato-acuminatis, apice mucronulatis, utrinque minutissime tomentoso-pubescentibus, subtus etiam a pilis longioribus vestitis, membranaceo-coriaceis; stipulis foliaceis, petiolos ascendentes hirsute tomentosos subæquantibus, late obovatis, apice oblique emarginatis, nonnunquam mucronulatis, minutissime tomentoso-pubescentibus; floribus mediocribus terminalibus vel axillaribus nunc solitariis, nunc in racemos maxime contractos dispositis; pedunculis pedicellisque ascendentibus, hirsuto-tomentosis; bracteis minutis, quam pedicelli multoties brevioribus; calyce amplo, late infundibulari, plerumque truncato, raro obscure lobato, puberulo; corollæ tubæformis, fere omnino glabræ, calycem circa 6-plo excedentis tubo paullo supra basin coarctato, sursum amplificato; lobis rotundato-ovatis, obtusissimis; staminibus inclusis; disco brevi, incrassato, ore leviter undulato, quam ovarium oblongo-ovoideum $2\frac{1}{2}$-plo breviore; ovulis 4-seriatis.

Hab. Florescit in sylvestribus juxta Corumbá mens. Jan. (N. 1009.).

Ramuli 0·2–0·4 cm. diam., deinde cortice cinereo sparsim lenticellis parvis obsito tecti. Foliola 4·5–9·5 cm. long., 2·5–4·5 cm. lat., subnitescentia, impunctata; costæ secundariæ utrovis latere 4–6, aperte arcuatæ, venis pag. inf. eminentibus, laxe reticulatis; petioli 0·5–1·7 cm. long., subteretes, crebre striati; petioluli 0·5 cm. long. Stipulæ firmæ, pleræque 1·0–3·0 cm. long., 1·0–1·5 cm. lat., extant vero minores. Racemi non ultra 1·5 cm. long., hirsuto-tomentosi; pedicelli pubescentes, ipso sub flore leviter ampliati, 0·5–1·0 cm. long. Calyx 0·8–0·9 cm. long., vix totidem diam., carnosulus, puberulus. Corolla alba, 5·0–6·0 cm. long., extus pæne glabra, intus juxta staminum insertionem pubescens, ceteroquin glabra; tubus basi vix 0·5 cm. lat., paullo supra basin ad 0·3 cm. coarctatus, sub limbo 1·5 cm. diam.; limbus 3·0 cm. diam. Antherarum loculi divaricati, oblongi, puberuli, 0·4 cm. long. Discus vix 0·1 cm. alt., 0·3 cm. lat. Ovarium 0·25 cm. long., minutissime pubescens, longitrorsum costulatum; stylus incrassatus, glaber, 4·5 cm. long.; stigmatis brevissime exserti lobi rotundati, 0·15 cm. long.

Species distinctissima, ob indumentum et folia brevipetiolata faciliter cognoscenda.

ANEMOPÆGMA DECORUM (sp. nov.). Fere omnino glabrum, caule ascendente, gracili, quadrangulari; foliis modice petiolatis, bifoliolatis, ecirrhosis sive sæpissime longe ac simpliciter cirrhosis, foliolis petiolulatis, ovatis vel late ovatis, basi rotundatis, leviter cordatis, apice breviter cuspidatis, papyraceis, utrinque, præsertim vero pag. sup., refulgentibus; stipulis amplis, rotundato-ovatis, amplexicaulibus, quam petioli brevioribus; floribus solitariis, axillaribus vel paucis ex axillis foliorum superiorum ortis, subumbellatim dispositis; inflorescentiis ultimis cymulosis, plerumque bifloris; pedicellis, calycem excedentibus, una cum inflorescentiæ axibus, gracilibus; calyce abbreviato, tubuloso-campanulari, ore truncato, obsolete 5-dentato; corollæ calycem 8-plo excedentis tubo a basi sensim ampliato; limbi lobis rotundatis, obtusissimis; staminibus inclusis; disco parvo; ovario cylindrico minute tomentello, ovulis 4-serialibus.

Hab. Crescit ad Corumbá, ubi inveni florescentem mens. Jan. (N. 980.)

Caulis 0·15–0·2 cm. diam., longitrorsum striatus. Foliola 7·0–9·0 cm. long., 4·0–6·5 cm. lat., basi plus minus obliqua, margine repanda, minutissime pellucido-punctata; costæ secundariæ utroque latere 4–6, distantes, raro oppositæ vel suboppositæ, juxta marginem arcuatim et undulatim connexæ; petioli 2·0–3·0 cm. long., graciles, subteretes, petiolulos circa duplo excedentes; cirrhi tenues, sursum filamentosi, usque ad 12·0 cm. long.; stipulæ ad 1·5 cm. lat., modicæ vero 0·8–1·0 cm., obtusæ vel obtusissimæ, brevissime apiculatæ. Pedicelli plerumque 1·5–2·5 cm. long. Calyx 0·6–0·7 cm. long., carnosulus, puberulus, ore ciliato. Corolla obscure puberula, 5·0 cm. long., tubus basi 0·3 cm. lat., mox usque ad 1·0 cm. ampliatus, sub limbo circa 1·5 cm. diam., intus basi puberulus. Filamenta longiora 1·0 cm. supra basin corollæ fixa, omnia glabra et crassiuscula; antheræ divaricatæ, oblongæ, vix 0·4 cm. long.; staminodium filiforme 0·55 cm. long., 0·35 cm. supra basin corollæ insertum. Discus 0·04 alt., ore undulato. Ovarium 0·3 cm. long., paullo ultra 0·1 cm. diam., apice parum attenuatum; stylus crassiusculus, complanatus, glaber.

Species eximia, forte haud procul ab *A. Chamberlaynii* (*Bignonia Chamberlaynii*, Sims) intercalanda, insigniter divergens vero foliorum formâ, stipulis multo majoribus, etc. [Bras. Or.]

ANEMOPÆGMA SYLVESTRE (sp. nov.). Scandens, caulibus gracilibus, subteretibus, ad nodos tumidis, crebro patenti-fulvo-pubescentibus, mox glabris; foliis breviter vel longius petiolatis, bifoliolatis, nunc ecirrhosis, nunc petiolo pubescente, demum glabro, in cirrhum longum simplicem excurrente; foliolis, a petiolulis brevibus fulvo-pubescentibus suffultis, lanceolatis vel ovato-lanceolatis, acutis vel breviter cuspidato-acuminatis, basi aliquanto coarctatis, reticulato-nervosis, coriaceo-membranaceis, nitidis; stipulis magnis, rotundato-ovatis, acutis vel obtusis vel obtusissimis, quam petioli brevioribus vel subæquilongis; floribus sat magnis, pedunculo brevissimo insidentibus, solitariis vel binis; pedicellis abbreviatis, pedunculum multo superantibus; bracteis exiguis; calyce late tubuloso-campanulato, ore truncato vel summum undulato; corollæ calycem 6-plo excedentis tubo curvato, basi sat lato,

paullo supra calycem dilatato; staminibus inclusis; disco lato, crassiusculo, ovarium oblongum, compressum, puberulum, circa $\frac{3}{8}$ æquante; ovulis 4-seriatis.

Hab. In ripis viget fl. Paraguay, dos Bugres, et Brasinho, ubi flores mens. Oct. præbet. (Nn. 433, 627, 634.)

Foliola ad 10·5 cm. long. (pleraque vero 7·5–9·0 cm.) et 3·0–4·5 cm. lat., glandulis vix pellucidis crebre instructa; costæ secundariæ utroque latere 6–8, distantes vel suboppositæ, inferiores oblique insertæ, supremæ patentes; petioli vix ad 3·0 cm. long. (plerique 1·0–2·5 cm.), patentes vel recurvi, petioluli plerumque 0·8–1·0 cm. long.; cirrhi usque ad 13·0 cm. long.; stipulæ pleræque circa 1·5 cm. long. et 1·0 cm. lat., glandulosæ. Pedunculi 0·2–0·3 cm. long., patenti-pubescentes. Pedicelli ±1·0 cm. long., patenti-pubescentes. Calyx subcarnosulus, fere glaber, 0·8 cm. long., ore 0·7–0·9 cm. lat., plus minus ciliato. Corolla fere glabra, alba, tubo dilute viridi in toto 5·0 cm. long.; tubus basi vix 0·5 cm. lat., sub limbo paullo ultra 1·0 cm. amplificatus, 4·0 cm. long., intus juxta staminum insertionem albo-pubescens, ceterum glaber; limbi 3·0 cm. diam., lobi rotundato-ovati, obtusissimi, subæquales, 1·2–1·3 cm. lat. Filamenta 1·5 cm. supra basin corollæ inserta, complanata, crassa, glabra; antheræ glabræ, vix 0·35 cm. long. et 0·1 cm. lat. Discus circa 0·15 cm. alt. Ovarium 0·4 cm. long., superne sensim attenuatum; stylus complanatus, glaber, 4·0 cm. long.; stigma brevissime exsertum, lobi sui ovati, acuminati, vix 0·3 cm. long.

Anemopægmati albæ, Mart., proximum, speciei mihi nisi descriptione ignotæ; ab eâ, attamen, stirpem meam facili negotio secernere potes, præter alia, ob folia nunquam 3-foliolata. [Bras. Or.]

PITHECOCTENIUM SQUALUS, DC. Prod. ix. p. 194.

Hab. In sylvestribus ad Corumbá mens. Jan. florescit. (N. 979.) [Bras. Or.]

TABEBUIA NODOSA, Griseb. Pl. Lorentz. p. 175 (ex descript.).

Frutex altus vel arbuscula. Flores lutei. (N. 1053.)

Hab. Viget in ditione Chacoensi ad Puerto Pacheco, mens. Feb. florens.

I have no hesitation in naming my specimens as above. The species, curiously enough, is closely allied to some Cuban ones, notably *T. trachycarpa*, Griseb., as Grisebach himself notes. [Argentina.]

TABEBUIA CHAPADENSIS (sp. nov.). Fere glabra, fruticosa, ramosa, ramis validis, teretibus, glabris, sparsim foliatis; foliis longius petiolatis, trifoliolatis, foliolis breviter petiolulatis, ovatis, utrinque rotundatis, apice emarginatis, coriaceis, penninervibus; costis secundariis utroque latere 5–6 sub margine arcuatis; floribus pedicellatis in racemum corymbiformem pauciflorum, foliis breviorem, e ramis defoliatis ortum dispositis; bracteis minutis, quam pedicelli multoties brevioribus; calycis tubuloso-campanularis ore breviter 5-dentato; corollæ calycem circa 5-plo excedentis tubo curvato, inferne gracili, imâ basi vero ampliore et superne sensim dilatato;

staminibus inclusis; disco incrassato, breviter cyathiformi; ovario cylindraceo, ovulis 2-serialibus.

Hab. Crescit in cacumine montium Serra da Chapada, mens. Aug. florens. (N. 79.)

Frutex parvus, diffusus, præsertim sursum foliatus. Ramuli patentes et reverâ angulo fere recto ramis inserti, bruneo-cinerei, sparsim ac grosse lenticelliferi, longitrorsum crebre striati. Petioli 5·5–6·0 cm. long., subteretes, imâ basi leviter ampliati, striati; foliola paullo imparia (scilicet folium terminale paullo majus), 6·5–8·5 cm. long., 4·5 vix 6·0 cm. lat., basi parum obliqua, margine leviter undulata, impunctata, supra obscure nitida ibique manifeste reticulato-nervosa, subtus pallida; petioluli suffulcientes ad 1·0 cm. long., folioli terminalis petiolulus paullo longior. Racemus 5·0 cm. long., 6-florus. Pedicelli usque ad 1·7 cm. long., plerique minores ad vel infra medium bracteati. Bracteæ triangulares, villoso-ciliatæ, 0·04 cm. long. Calyx 0·8–0·9 cm. long., 0·6 cm. lat., puberulus, subcarnosulus. Corolla 4·5 cm. long., extus velutino-tomentosa, intus tomentella et ad staminum insertionem villosa, pallide purpurea, faucibus albis imâ basi 0·6 cm. lat., paullulum supra basin ad 0·3 cm. coarctata, sub limbo circa 1·5 cm. lat. Filamenta 0·6 cm. supra basin corollæ inserta, aliquanto incrassata, fere glabra; antheræ loculi divaricati, lineari-oblongi, 0·35 cm. long. Discus 0·1 cm. alt., vix 0·3 cm. diam. Ovarium 0·1 cm. lat.; stylus glaber, circa 2·5 cm. long.; stigmatis lobi ovati, acuminati, 0·25 cm. long. Capsula ignota.

Forsan ex affinitate *Tabebuiæ hemanthæ*, DC., et *T. tryphyllæ*, DC., sed multis signis ab ambabus dispar. [Ind. Occ.]

TABEBUIA AUREA?, Benth. et Hook. f. Gen. Pl. ii. 2, p. 1042. (*Bignonia aurea*?, Silva Manso.) Arbor formosa, usque ad 12-metralis, tempore florendi foliis orba vel etiamnum instructa, crebre ramosa, sursum solummodo foliigera; ramulis ultimis 0·6 cm. diam., fere rectis, ad foliorum insertionem paullo ampliatis, cinereis, lenticellis eminentibus ellipticis majusculis inspersis; foliis longipetiolatis (pet. usque ad 11·0 cm. long.), digitatim 5-foliolatis; foliolis oblongis vel oblongo-ovatis, obtusissimis, inferne obliquis ibique rotundatis, coriaceis, glabris (8·5–9·0 cm. long.), petiolulis elongatis fol. cent. eos fol. lat. semi-excedentibus, obesis, basi dilatatis, usque ad 5·0 cm. long. insidentibus; costâ mediâ subtus eminente; costis secundariis utrinque 6·7, angulo fere recto insertis, nonnunquam suboppositis, sub margine revoluto arcuatim et undulatim connexis; paniculæ quam folia breviores, ramis incrassatis, vix alatis, plurifloris; bracteis parvis, triangulari-ovatis, acutis, deciduis, 0·2 cm. long.; floribus brevipedicellatis; calyce 1·5 cm. long., medio 0·5 cm. lat., ad 0·4 cm. fisso; corollâ aureâ, vix 7·0 cm. long., sub limbo 2·0 cm. lat.

Hab. Inter Cuyabá et Serra da Chapada sat abundat, itaque ipsis in montibus; mens. Aug. floret. (N. 39.)

Silva Manso (Enum. Subst. Bras. p. 40) gives a very brief diagnosis of his *Bignonia aurea*, which was copied by De Candolle in the 'Prodromus.' My chief reason for thinking this plant to be the same as Manso's is that it is so common and so conspicuous an object near Cuyabá that it could scarcely have been overlooked by Manso's collectors;

moreover, I saw no other *Tabebuia* with golden flowers in the neighbourhood. On the other hand, mine differs from Manso's in the leaflets not being cordate at the base, and in being supported on petiolules sometimes at least half as long as the leaflet itself, and these could not be correctly described as "breviusculis," which is the term applied by Manso to the petiolules of his plant. Unfortunately, my only specimen of this tree is but a poor one, so that I cannot say whether the points of difference above-mentioned are or are not constant.

[Tabebuia Avellanedæ, Lorentz.

Hab. Crescit passim in provinciâ. Tempore florendi foliis caret. Flores rosacei.

This is the celebrated Lepacho tree, very well known in Paraguay, and a conspicuous feature in the August landscape some way up into Matto Grosso ; our woodcutters found it even above Santa Cruz, the wood being in constant use for the furnace; indeed, for this purpose it is preferred to that of all other trees. Although I saw plenty of the trees, especially in passing up the river, I was unable to secure either flowering or fruiting specimens.] [Argentina, Paraguaria.]

In hoc genus verisimiliter trahenda sunt specimina duo insequentia :—

i. Tabebuia, sp. indet. Arbuscula tempore florendi foliis orba, caule sat valido, undulato, a lateribus compresso, cinereo, glabro, longitrorsum striato ; paniculis thyrsoideis, pubescentibus, 15·0–18·0 cm. long., plurifloris ; floribus purpureis, mediocribus, geminis, a pedicellis erectis, gracilibus, sub apice amplificatis fultis ; calyce parvo, angusto, tubuloso, ore breviter subæqualiter 5-lobo, minute pubescente, 0·5 cm. long., 0·3 cm. lat. ; corollæ, extus puberulæ, calycem 10-plo excedentis, tubo 5·0 cm. long., paullo supra calycem angustate, deinde sensim ampliato, sub limbo circa 1·5 cm. diam. ; limbi 2·5 cm. diam., lobis rotundatis, obtusis ; staminibus inclusis ; filamentis, 1·0 cm. supra basin corollæ fixis, glabris. Nec folia nec fructus suppetebant.

Hab. Inveni in cacumine montium Serra da Chapada, inter Cuyabá et Santa Anna da Chapada, mens. Aug. florentem. (N. 201.)

This is closely related, in all probability, to the Lepacho, but very distinct in many points.

ii. Tabebuia, sp. indet. Fruticulus humilis, caule erecto, minute puberulo, subterete, inferne 0·7 cm. diam. ; foliis longe ac obese petiolatis, 4–5-natis ; foliolis exterioribus brevissime petiolatis, latere interiore basi excepto, omnibus coriaceis, supra puberulis, subtus minute pubescentibus, foliolorum reliquorum petiolulis laminâ 3–3½-plo brevioribus, foliolis obovato-oblongis, apice emarginatis, basi leviter cordatis ; petiolis facie superiore late canaliculatis. Neque flores vidi nec fructus.

Hab. Crescit ad Santa Cruz, ubi *Para-todo* nuncupatur. (N. 555 *a.*)

Petioli 11·0–15·0 cm. long., usque ad 0·5 diam., erecti, rigidi, longitrorsum striati, minute puberuli. Foliola exteriora 5·0–14·0 cm. long., paria interdum maxime inæqualia ;

foliola interiora 12·0–18·0 cm. long., 5·0–9·0 cm. lat., omnia crebre pellucido-punctata; costæ secundariæ utrinque circa 6, una cum costâ mediâ subtus maxime eminentes: petioluli obesi, late canaliculati, 3·0–6·0 cm. long.

According to Silva Manso, the true *Para-todo* is his *Bignonia aurea*, already referred to, but the present plant is certainly different from that. Although I could get neither its flowers nor its fruit, I feel convinced that my plant is a *Tabebuia*, sessile external leaflets being characteristic of many species of the genus.

As its name implies, the plant is considered a universal specific by the credulous country-people.

Jacaranda cuspidifolia, Mart. in Flora, xxiv. (1841) II. Beibl. 51.

Hab. Frequens in sylvestribus prope Santa Cruz, ubi flores et fructus simul fert menss. Sept. et Oct. (N. 337.)

Arbor gracilis, usque ad 12-metralis, ramis cinereis. Foliola 1·0–1·8 cm. long. Capsula 6·5 cm. long., 6·0 cm. diam. Semina 2·5×1·5 cm., nucleo 0·6 cm. diam.

The species is endemic in Matto Grosso.

ACANTHACEÆ.

Hygrophila longifolia, Nees in Mart. Fl. Bras. ix. p. 21.

Hab. Crescit in ripis fl. Paraguay prope Santa Cruz, mens. Sept. florens. Erecta, ultrametralis. Flores purpurei. (N. 322.) [Bras. Or., Uruguaria, Mexico.]

Stephanophysum longifolium, Pohl, Ic. Plant. Bras. ii. p. 85.

Hab. In sylvestribus montium Serra de Tapirapuan mens. Sept. floret. (N. 384.) [Bras. Or., Amazonia, Peruvia.]

Ruellia Puri, Mart. ex Nees in Mart. Fl. Bras. ix. p. 35.

Hab. Crescit in angustiis montium Serra da Chapada, mens. Aug. florens. (N. 71.) [Bras. Or.]

Ruellia Puri, Mart., var. longipetiolata (var. nov.).

Foliorum inferiorum petioli 4·5 cm. long., et lamina dimidio breviores.

Hab. Reperi ad Serra da Chapada mens. Aug. florentem. (N. 174.) Planta deorsum aphylla. Flores purpurei.

Ruellia geminiflora, H. B. K. Nov. Gen. et Sp. ii. p. 240.

Hab. Frequens inter Cuyabá et Santa Cruz, ubi floret menss. Sept.–Nov. (N. 605.) [Amer. Austr. Trop. et Subtrop., Ins. Trinitatis.]

Ruellia geminiflora, H. B. K., var. nudipes (var. nov.). Caulis sursum solummodo foliatus. Folia parva, ovata vel lanceolata, 2·0– vix 3·0 cm. long., hirsutulo-pubescentia. Corolla, extus pubescens, 3·0–3·5 cm. long. Antheræ oblongæ, basi acutæ, 0·35–0·38 cm. long.

Hab. Inter Cuyabá et Serra da Chapada satis abundat, mens. Aug. flores lilacinos ostendens. (N. 43.)

RUELLIA HUMILIS, Pohl, ex Nees in Mart. Fl. Bras. ix. p. 39.

Hab. Crescit in arenosis apertis juxta Santa Cruz, mens. Nov. flores lacteos præbens. [Bras. Or., Goyaz, Guiana.]

Huic generi etiam refero specimina duo nimis manca et reverâ floribus orba, nempe:—

i. RUELLIA (§ DIPTERACANTHUS), sp. affinis *R. patulæ*, Salzmann.

Hab. Fructificat ad Santa Cruz mens. Nov. (N. 582.)

ii. RUELLIA (§ CRYPHIACANTHUS), sp. nov.? Accedens ad *C. udum*, Nees, plantam mihi non obviam et ex descriptione solum cognitam. Stirps nostra a *C. udo* abhorret foliis petiolatis, calycis glabri (nequaquam hirsuti) laciniis angustissimis, 1·1 cm. long., capsulam æquantibus.

Hab. Ad Corumbá lecta mens. Jan. (N. 964.)

STENANDRIUM PRÆCOX (sp. nov.). Scaposus, rhizomate valido, noduloso, radices longissimas parce fibrillosas emittente, scapis folio unico parvo nondum expanso basi munitis, pubescentibus, crassiusculis; floribus sat magnis, sessilibus, confertis; bracteis lanceolatis acutis vel acutiusculis, calycem excedentibus; bracteolis bracteis similibus nisi multo minoribus; calycis inæquipartiti lobis lanceolatis acutis; bracteolis longioribus; corollæ sat magnæ tubo parum curvato, faucibus brevibus et parum ampliatis; limbi lobis posticis brevioribus et altius connatis; antheris barbellatis; capsulâ ignotâ.

Hab. Exemplarium unicum reperi in sylvâ juxta Santa Cruz mens. Sept. florens. (N. 293.)

Rhizoma 0·4 cm. crass.; radices ad 22·0 cm. long., primo tenues, mox quodammodo incrassatæ; fibrillæ tenuissimæ, simplices vel subsimplices. Folia petiolata, adulta oblanceolata (?), obtusa, subtus fulvo-tomentosa. Scapi ad 14·0 cm. alt., triente superiore florigeri, minute pubescentes, saltem in sicco lateraliter compressi. Bracteæ 0·35–0·5 cm. long., firmæ, erectæ, utrinque minute pubescentes, albido-hirsutulo-ciliatæ; bracteolæ 0·2 cm. long., ciliatæ. Flores dilute purpurei. Calycis lobi 0·25–0·3 cm. long., usque ad 0·1 cm. lat., membranacei, extus puberuli, margine ciliolati. Corollæ extus pubescentis tubus 0·7 cm. long., basi 0·13 cm. lat., faucibus 0·3 cm. diam.; limbi circa 1·3 cm. diam., lobi antici 0·65–0·7 cm. long., 0·4 cm. lat., lobi postici 0·45 cm. long., vix 0·3 cm. lat.; corolla intus, palato crispe pubescente exempto, glabra. Filamenta antheris æquilonga, glabra, 0·5 cm. supra basin corollæ fixa; antheræ parum inæquales, usque ad 0·1 cm. long.

Nulli nisi *S. Riedeliano* affine, sed, præter alia, floribus præcocibus, confertis, majoribus, et bracteis longioribus, calycem inæquipartitum excedentibus, faciliter distinguendum. [Bras. Or.]

STENANDRIUM AFFINE (sp. nov.). Humilis, caulescens, radicibus pluribus orthotropis seu plagiotropis, in initio attenuatis, mox incrassatis, fere simplicibus; caule erecto-

simplici vel sursum parum ramoso, patenti-hirsuto-hispidulo, dein pubescente; foliis subsessilibus, raro brevissime petiolatis, lanceolatis vel lanceolato-oblongis, obtusis vel acutiusculis, basi leviter attenuatis, margine ciliatis, ceteroquin appresse pilosis, nequaquam nitentibus; spicis abbreviatis, paucifloris, pedunculis sat elongatis, sæpe folia excedentibus, axillaribus vel terminalibus, hispidulo-hirsutis, aphyllis; bracteis lanceolatis, acutis vel acuminatis, nunquam apice ipso leviter incrassatis, longe ciliatis; bracteolis subulatis, calycem semi-æquantibus, dorso puberulis, margine ciliolatis; calycis lobis parum inæqualibus, lineari-lanceolatis; corollæ tubo, calycem paullo excedente, parum curvato, faucibus brevibus, lobis posticis paullulum altius connatis, lobo antico majusculo; capsula ignota.

Hab. Viget circa Santa Cruz, ubi mens. Nov. floret. (N. 588.)

Radices ad 6·0 cm. long., nunc subito, nunc gradatim incrassatæ, undulatæ, nec ultra 0·15 cm. diam. Caulis semispithameus vel minus, teres, sursum tantummodo foliiger· Folia plerumque 2·0–3·5 cm. long., 0·8–1·0 cm. lat., inferiora plerumque minora et interdum fere obsoleta; costæ secundariæ utrinque modo 3–4, oblique insertæ, ascendentes, inde margini parallelæ, par infimum subobsoletum; costa media subtus maxime prominula, crassiuscula, in sicco pilis strigosis albidis plus minus dense obsita. Pedunculi plerique 1·0–4·0 cm. long., una cum caule pilis plerumque ochraceis vel subfulvis, raro albidis instructi. Spicæ pleræque circa 1·0 cm. long., raro 1·7 cm. attingentes. Bracteæ 0·5–1·0 cm. long., arcte imbricatæ, dorso appresse strigoso-pilosæ, 5-nerves, reticulato-nervosæ; bracteolæ circa 0·2 cm. long., firmæ, carinulatæ. Flores albi, faucibus luteolis. Calyx vix 0·4 cm. long.; lobi acuminati, dorso puberuli. Corollæ circa 0·7 cm. diam. tubus vix 0·5 cm. long., 0·07 cm. diam., faucibus antice fulvo-pubescentibus; limbi lobi postici obovati, 0·25 cm. long.; lobi laterales postici subsimiles nisi paullo longiores; lobus anticus rotundato-ovatus, extus pilosulus, intus basi fulvo-pubescens. Filamenta antheris breviora, 0·23 cm. supra basin corollæ inserta; antheræ dense albo-barbellatæ, 0·12 cm. long. Ovarium oblongum, 0·12 cm. long., glabrum; stylus vix 2·5 cm. long.; stigma 0·03 cm. long.

Species inter *S. hirsutum*, Nees, et *S. villosum*, Nees, ambigens, et certo ambobus arcte affinis. Ab illo abhorret staturâ humiliore, spicis abbreviatis, bracteis minoribus haud elliptico-oblongis obtusis cum mucronulo, bracteolis puberulis comparate longioribus nec calyce $\frac{1}{3}$ brevioribus et glabris, corollæ tubo breviore et limbo diam. minore, etc. Ab *S. villoso* distat, inter alia, ob indumentum dispar, et corollam albam nec rubro-violaceam. [Bras. Or.]

Stenandrium spathulatum (sp. nov.). Caulescens, herbaceum, subspithameum vel pusillum; radicibus elongatis, simplicibus, plus minus plagiotropicis, in initio tenuibus, mox paullo ampliatis; caule rhizomate brevi, erecto, simplici vel sparsim ramoso, minute tomentoso; foliis ovatis vel obovatis, obtusissimis, nonnunquam levissime emarginatis, in petiolum brevem sensim desinentibus, interdum vero basi subrotundatis, firmis, membranaceis; spicis simplicibus, brevibus, a foliis superatis, pedunculatis vel subsessilibus, densi- et paucifloris; bracteis elongatis, spathulatis,

calycem excedentibus, hispidulo-puberulis; bracteolis, calyce multo brevioribus, subulatis; calycis lobis manifeste inæqualibus; corollæ tubo, calyci subæquilongo, deorsum et in faucibus ampliato; lobis posticis reliquis minoribus et altius connatis; antheris apice barbellatis; capsulâ oblongâ, 4-spermâ, seminibus hispidulis.

Hab. Crescit ad Corumbá, ubi mens. Jan. florescit. (No. 958.)

Herba parva, interdum nec ultra 4·0 cm. alt. Rhizoma parum tortuosum vel rectum, usque ad 0·25 cm. diam., sæpe vero tenuius; radices ad 7·0 cm. long. et 0·1 cm. diam., in sicco una cum rhizomate bruneæ. Caulis teres, 0·1 cm. diam., rectus, nodis nequaquam tumidis. Folia spec. majoris ad 6·5 cm. long. et 3·6 cm. lat., specc. minorum nec ultra 3·3 cm. long. et 1·9 cm. lat., omnia subtus decoloria; costæ secundariæ utroque 4–6, suboppositæ vel alternantes, costæ mediæ oblique insertæ. Spicæ, pedunculo haud exempto, 1·0–2·0 cm. long.; pedunculi soli nonnunquam 1·0 cm. attingentes, minute tomentosi; spicæ ipsæ 1·0–1·5 cm. long., 1·0–1·3 cm. diam. Bracteæ 0·7–0·8 cm. long., inferne late lineares, superne subito spathulato-dilatatæ, plane reticulato-nervosæ, margine ciliatæ. Bracteolæ vix 0·2 cm. long., puberulæ. Flores dilute punicei. Calycis 0·5 cm. long., lobi anguste lineares, acutati, puberuli. Corollæ extus puberulo-pilosæ tubus intus puberulus, vix 0·5 cm. long., basi 0·18 cm. lat., ad staminum insertionem usque ad 0·1 cm. coarctatus, faucibus circa 0·25 cm. diam.; labii antici, 0·65 cm. long., lobi laterales oblongi, lobus intermedius ovatus, basi pubescens, omnes obtusi; labii postici lobi ad $\frac{1}{4}$ connati, oblongi, obtusiusculi, lobis anticis paullo breviores. Stamina 0·28 cm. supra basin corollæ affixa; filamenta antheris duplo breviora; antheræ anguste lineares, 0·12 cm. long.; staminodium brevissimum. Ovarium oblongum, apice ipso subito angustatum, puberulum, 0·17 cm. long.; stylus 0·25 cm. long., sursum parum incrassatus ibique pilosulus; stigmatis lobi abbreviati. Capsula pallida, 0·6 cm. long.; valvæ obtusæ, puberulæ. Semina brunea, 0·15 cm. diam., retinaculis apice dilatatis fulta.

Nulli nisi *Stenandrio mandioccano*, Nees, affine, abs quo abhorret staturâ humili, foliis disparibus, bracteis multo minoribus etiamsi satis similibus, floribus minoribus haud pubescentibus, capsulis haud fuscis. [Bras. Or.]

Eranthemum congestum (sp. nov.); caule e rhizomate elongato, ascendente, parum ramoso, geniculato, pubescente, mox glabro et cortice laxo cervino annulatim et lemniscatim disrupto obtecto; foliis æqualibus vel subæqualibus, ad apicem ramulorum novellorum confertis, parvis, sessilibus, lanceolatis vel ovato-lanceolatis, raro ovatis, obtusis vel acutiusculis, deorsum attenuatis, subtus puberulis; floribus, ex axillis foliorum superiorum ortis, breviter pedunculatis; bracteis bracteolisque subæqualibus, lineari-lanceolatis, acuminatis, pedicello subæquilongis; calycis lobis linearibus, acuminatis; corollæ parvæ calycem circa 3-plo excedentis limbi lobis æqualibus; staminibus subsessilibus; antheris inclusis, basi obtusis; disco cupulari, ovario late oblongo, stylo apice bilobo, capsulâ generis.

Hab. In sylvis reperi prope vicum Jangada mens. Sept. pl. florentem et fructificantem. (N. 264.)

Semimetrale vel minus. Caulis, ramulis novellis exemptis, omnino aphyllus, subteres, juveniles compressiusculi et, secus lineas duas crispe pubescentes, dein glabri. Folia usque ad 4·3 cm., plerumque vero 2·0–3·0 cm. long., 1·0–1·5 cm. lat., membranacea, subtus decoloria; costæ secundariæ utrinque circa 4, superiores eximie fornicatæ, inferiores primo subrectæ, dein arcuatæ. Pedunculi 0·25 cm. long., 0·075 cm. lat., puberuli. Bracteæ et bracteolæ circa 0·25 cm. long., dorso minute pubescentes. Flores dilute cærulei. Calyx 0·5 cm. long., fere usque ad basin minute pubescens. Corollæ tubus, extus puberulus, 1·4 cm. long., basi 0·16 cm., medio vix 1·0 cm., superne fere 0·2 cm. lat.; limbi lobi oblongi, obtusi, 0·55 cm. long. Filamenta, 1·0 cm. supra basin corollæ fixa, vix 0·1 cm. long.; antheræ 0·22 cm. long.; staminodia abbreviata, filiformia, filamentis paullo breviora. Ovarium 0·15 cm. long. Capsula 1·6–1·8 cm. long., obscure puberula, pars seminifera 0·9 cm. long.; valvæ acutatæ; retinacula obtusa, 0·2 cm. long. Semina 0·25 cm. diam., cinerea, minute scrobiculata

Affine *Eranthemo heterophyllo*, Nees, cujus folia attamen nequaquam congesta et multo majora, flores majores, antheræ multo breviores et filamentis duplo longioribus fultæ, ovarium anguste lineare nec late oblongum, et capsula longior. [Bras. Or.]

Chætothylax tocantinus, Nees, in Mart. Fl. Bras. ix. p. 140.

Hab. Inveni in ripâ fl. Paraguay, juxta Santa Cruz, mens. Sept. (N. 306.) [Bras. Or., Goyaz.]

Justicia (§ Gendarussa) Oreadum (sp. nov.); caule ascendente, obscure tetragono, passim geniculato, striato, pubescente, mox glabro et nitido; foliis amplis, late ovato-lanceolatis, longe acuminatis, basi in petiolum 1·2–2·5 cm. long. attenuatis, utrinque subappresse pilosis, tenuiter membranaceis; spicis solitariis, terminalibus, foliis brevioribus, simplicibus, pubescenti-tomentellis, pedunculo brevi pubescente vel puberulo insidentibus; bracteis parvis, lineari-lanceolatis, leviter acuminatis, calycem subæquantibus vel excedentibus; bracteolis lineari-lanceolatis, quam calycis segmenta inæqualia ejusdem formæ fere duplo brevioribus, omnibus (sc. brac., bracteol., et cal. seg.) pubescentibus; corollæ majusculæ tubo, calycem $2\frac{1}{2}$-plo excedente, quam limbus paullo longiore, recto, medio constricto, sursum valde amplificato; disco lobato, quam ovarium 3-plo breviore; ovario oblongo, obtuso, puberulo; stigmate simplici.

Hab. Inveni in vallecula umbrosâ in montibus Serra da Chapada ad circa 300 met. alt. supra mare. (N. 172.)

Ultrametralis, diffusus, superne tantum foliatus. Folia ad 17·0 cm. long. (sæpius vero circa 12·0 cm.), 4·5–6·5 cm. lat., margine repanda, basi subito vel gradatim attenuata; costæ secundariæ utrinque circa 10, inferiores fere rectæ, superiores arcuatæ; venulæ laxe reticulatæ, inconspicuæ; petioli circiter 1·5 cm. long., mox piloso-puberuli, sursum anguste alati. Spicæ circa 6·0 cm. long., erectæ; pedunculi 1·3–2·0 cm. long. Bracteæ fll. inf. ad 0·8 cm., fll. sup. 0·4–0·5 cm. long., uninerviæ. Bracteolæ vix 0·3 cm. long. Calycis segmentum posticum reliquis fere 0·5 cm. long. paullo

angustius et modo 0·35 cm. long. Alabastrum aperiens 2·0 cm. long., extus minute pubescens. Corollæ subviridis purpureo-lineatæ tubus 1·1 cm. long., basi 0·2 cm., sursum 0·6 cm. lat.; labium anticum vix 1·0 cm. long. et lat., late obovatum, ad 0·15 cm. obtusissime trifidum; labium posticum antico paullo breviore, rotundato-ovatum, obtusum, integrum. Stamina ad 0·8 cm. a basi corollæ inserta; filamenta cava, aliquanto complanata, 0·7 cm. long.; connectivus crassiusculus; antherarum loculi elliptici, complanati; loc. superior apice breviter apiculato, loc. inferior calcari brevi albo curvato instructus. Discus conspicuus, 0·07 cm. alt. Ovarium circa 0·2 cm. long. et 0·08 cm. lat., subcompressum; stylus 1·2 cm. long., basi obsolete pilosula. Capsulæ desiderantur.

Species distinctissima, nec cum ullâ congenerum mihi cognitâ conferenda.

Justicia (§ Amphiscopia) Metallicorum (sp. nov.). Spithamea, radicibus elongatis, fibratis, rectis vel paullo undulatis, cinereis, radicellis paucis tenuissimis exemptis simplicibus; caule e rhizomate brevissimo, crassiusculo, crebre radicigero, assurgente, terete, simplici (an semper?), tenui, dimidio inferiore aphyllo, obscure geniculato; foliis aliquanto confertis, ovatis acutis vel obtusis, raro parum cuspidatis, deorsum in petiolum perbrevem gradatim desinentibus, membranaceo-coriaceis, puberulis; spicâ terminali foliis subæquilongâ deorsum e spicis oppositis brevibus sursum simplici pubescente; bracteis, bracteolis, calycisque segmentis pilis glandulosis et simplicibus, hirsutulis, illis obovatis acutis, calyce brevioribus; bracteolis lanceolatis, bracteis æquilongis; calycis 5-partiti segmentis linearibus acutis; corollæ mediocris tubo limbo subæquilongo, fere recto, sursum gradatim ampliato; disco cupulari; ovario oblongo, triquetro, pubescente; stigmate spathulari; capsulâ oblongâ, acuminatâ, compressâ, minute pubescente; seminibus 4, retinaculis truncatis suffultis.

Hab. Reperi inter Cuyabá et Serra da Chapada mens. Aug. flores et fructus simul ostendentem. (N. 44.)

Radices ad 13·0 cm. long., in initio 0·1 cm. diam., sensim attenuatæ. Caulis levis, in sicco prasinus, circa 0·15 cm. diam., in nodis vix tumidus, sed, floribus dilapsis, plane nodulosus; internodia lineâ longitudinali pilosâ instructa. Folia ad 6·0 cm. long., plerumque vero 4·0–4·5 cm., medio 2·2–2·8 cm. lat., pag. inf. dilutius virentia: costa media subtus eminens, costæ secundariæ utrinque 5–7, sub margine obscure arcuatim injunctæ. Spica 6·0 cm. long., pedunculo 1·5 cm. long. sustenta. Bracteæ 0·6 cm. long., 0·35 cm. lat., uninerviæ, firmæ, in sicco virentes. Bracteolæ 0·6 cm. long., acutæ, deorsum sensim coarctatæ. Calycis segmentum posticum reliquis minus, hæc 0·65 cm., illud 0·55 cm. long. Alabastrum aperiens 1·15 cm. long. Corollæ pubescentis tubus 0·5 cm. long., basi 0·17 cm. lat., sub fauce ad 0·3 cm. amplificatus; labium anticum vix 0·7 cm. long. et lat., late obovatum, ad 0·13 cm. alt., obtusissime trifidum; labium posticum antico breve, æquipede-triangulari, marginibus inflexis; palatus convexus, nervosus. Stamina ad 0·4 cm. a basi corollæ affixa; filamenta cava, sub antherâ angustata; connectivus expansus; anthera inferior (calcare incurvo incluso) 0·12 cm. long. Discus obsolete crenellatus, 0·04

cm. alt. Ovarium 0·33 cm. long., sursum in stylum puberulum duplo longiorem gradatim attenuatum. Capsula 0·6 cm. long., stipite 0·15 cm. lat. fulta. Semina plano-compressa, suborbicularia, 0·17 cm. diam., fusco-brunea, tuberculis minimis albidis inspersa.

Ex affinitate *Justiciæ pilosæ*, Benth. et Hook. f. (*Adhatodæ pilosæ*, Nees), cujus folia et spicæ longe dispares, etc. [Amazonia, Peruvia.]

Justicia (§ Amphiscopia) chapadensis (sp. nov.). Bipedalis, caule elato, folioso, subterete, ad nodos tumido, cito glabro; foliis brevipetiolatis, lanceolatis, acutis vel obtusis, basi gradatim coarctatis, glabris, membranaceo-coriaceis; foliis brevioribus, simplicibus, aggregatis, pubescentibus; spicis axillaribus vel terminalibus; bracteis, bracteolis, calycisque segmentis hirsutis, parce glandulosis, illis late ovatis acutiusculis, calycem paullo excedentibus; bracteolis lanceolatis, calycem subæquantibus; calycis segmentis anguste linearibus, inæqualibus (sc. seg. postico reliquis breviore); corollæ mediocris tubo calycem subæquante, sed limbo breviore, cylindraceo, superne parum ampliato; disco anguste cupulari; ovario oblongo-ovoideo, pubescente; stigmate breviter bifido; capsulâ oblongâ acutâ, compressâ, minute pubescente; seminibus 4, retinaculis truncatis fultis.

Hab. Vigebat mens. Aug. in angustiis montium Serra da Chapada ad circa 300 met. alt. (N. 199.)

Caulis circa ad 0·25 cm. diam., nodis ad 0·4 cm. incrassatis, prasinus. Folia pleraque 7·0–12·0 cm. long. et 3·0–4·0 cm. lat., margine obscure undulata, firma, in sicco supra viridia, subtus lutescentia, costæ secundariæ utrinque circa 10, leviter arcuatæ, demum margini parallelæ; petioli circa 0·5 cm. long., canaliculati. Spicæ 0·4–0·7 cm. long., pedunculis 1·0–1·5 cm. long. sustentæ, superiores subsessiles. Bracteæ 0·8 cm. long., 0·4 cm. lat., uninerviæ, firmæ, in sicco virides; bracteolæ 0·7 cm. long., uninerviæ, deorsum sensim angustatæ. Calycis segmentum posticum 0·5 cm., seg. antica 0·6 cm. long. Alabastrum aperiens vix 1·3 cm. long. Corollæ albæ purpureo-maculatæ pubescentis tubus 0·53 cm. long., basi 0·2 cm. lat., sub fauce 0·4 cm.; labium anticum 0·7 cm. long., 0·8 cm. lat., ad 0·13 cm. obtusissime trifidum; labium posticum antico brevius, ovato-cuspidatum, marginibus planis; palatus convexulus, nervosus. Stamina ad 0·4 cm. a basi corollæ affixa; filamenta cava, superne leviter angustata; connectivus expansus; anthera superior (calcare curvato incluso) vix 0·2 cm. long. Ovarium circa 2·5 cm. long., sursum in stylum puberulum 4-plo longiorem subito attenuatum. Capsula 0·7 cm. long., rugosula, stipite 0·2 cm. lat. fulta. Semina suborbicularia, 0·15–0·17 cm. diam., fusco-brunea, tuberculis minutis albidis inspersa.

Stirpis hujus exstat varietas insequens:—

Var. nudicaulis, caule geniculato deorsum, nudo; foliis parvis nec ultra 7·0 cm. long. et 2·2 cm. lat.; bracteis ovato-lanceolatis vel lanceolatis, acuminatis.

Hab. Crescit ad Santa Cruz, ubi flores dilute purpureos fert mens. Sept. (N. 294.)

Species præcedenti arcte affinis, sed, præter signa levioris momenti, primo obtutu agnoscenda ob folia disparia et bracteas latiores. [Amazonia, Peruvia.]

Beloperone nodicaulis, Nees in Mart. Fl. Bras. ix. p. 140.

Hab. Planta metralis; flores puniceos præbuit ad Santa Cruz mens. Sept. (N. 306.) [Bras. Or., Goyaz.]

Beloperone riparia (sp. nov.). Siccitate nigricans, caule tenui, subtetragono, geniculato, parum noduloso, puberulo, mox glabro, et albido vel fusco-cinereo; foliis petiolatis, utrinque (præsertim apice) longe acuminatis, supra, præsertim in nervis, minute puberulis, subtus pubescentibus, deinde puberulis; spicis quam folia multoties brevioribus in axillis supremis solitariis (an unquam vere terminalibus?), pedunculis brevibus validis insidentibus; bracteis parvis, lineari-lanceolatis, longe acuminatis, calyce longioribus; bracteolis lineari-subulatis, calycem subæquantibus; calycis 5-partiti segmentis subæqualibus, anguste lineari-lanceolatis acutis; corollæ calycem multo excedentis tubo recto, limbum subæquante, sursum leviter ac gradatim amplificato; labio antico late oblongo ultra medium 3-lobo, labio postico erecto lanceolato integro; disco cupulari; ovario oblongo, apice subito in stylum 3-plo longiorem desinente; capsulâ . . . .

Hab. Juxta Corumbá legi florentem mens. Jan. (N. 1047.)

Caulis deorsum aphyllus, striatus, sparsim lenticellifer. Folia 5·0–11·0 cm. long., 2·5–4·5 cm. lat., tenuiter membranacea; petioli 1·0–1·5 cm. long., puberuli, sursum alati, anguste canaliculati; spicæ nec ultra 3·0 cm. long., puberulæ, pedunculis circa 0·5 cm. long. fultæ. Bracteæ 0·8 cm. long., basi nec ultra 0·1 cm. lat., firmæ. Bracteolæ inæquales circa 0·4 cm. long. Flores purpurei. Calycis segmenta minute puberula, 0·4 cm. long. Alabastrum aperiens 0·5 cm. long. Corollæ extus pubescentis tubus circa 1·0 cm. long., basi 0·1 cm., superne 0·2 cm. lat.; lobus medius lateralibus duplo latior, omnes erecti; labium posticum antico æquilongum. Stamina faucibus ipsis inserta; filamenta 0·15 cm. long.; connectivus filiformis, antheræ ellipticæ, 0·2 cm. long., loculus inferior breviter calcaratus. Ovarium 0·16 cm. long., compressum, glabrum; stylus 0·8 cm. long., glaber.

Species distinctissima, nulli affinis mihi aut scrutatione aut descriptione cognitæ.

Dianthera pectoralis, F. G. Gmel. Syst. Veg. p. 36.

Hab. In sylvis primigeniis juxta Santa Cruz floret mens. Sept. (N. 348.) Flores dilute purpurei. [Amer. Trop.]

Dianthera paludosa (sp. nov.). Sesquispithamea vel ultra, caule e basi repente ad nodos radicante, erecto, crasso tetragono, omnino herbaceo, albide villosulo-pubescente, deinde puberulo; foliis subsessilibus oblongis vel oblongo-lanceolatis, obtusis vel obtusissimis, basi obtusis vel leviter cordatis et parum amplexicaulibus, subtus, præsertim in costâ centrali, appresse pubescentibus, supra fere omnino glabris; floribus mediocribus, in spicas ex axillis superioribus ortas, pedunculatas, paucifloras unilateraliter digestis; bracteis bracteolisque pusillis, calyce multoties brevioribus; calycis alte 5-partiti lobis acuminatis, lobo postico reliquis paullo breviore; corollæ

calyci subæquilongæ tubo basi sensim dilatato, faucibus parum constrictis; labio postico verisimiliter integro, labio antico fere usque ad basin diviso; staminibus labio postico paullo brevioribus; antheris subæqualibus, alterâ sursum, alterâ lateraliter spectantibus, hâc (sc. antherâ inferiore) basi obscure mucronatâ; disco cyathiformi, ore lobulato vel subtruncato; capsulâ oblongo-ovoideâ, lateraliter compressâ, tetraspermâ.

Hab. In paludibus ad Corumbá floret mens. Jan. (N. 941.)

Radices fibrosæ, undulatæ, sparsim fibrillatæ, fuscæ. Caules circa 4·0–5·0 cm. diam., interdum parum geniculatæ, ad nodos obscure tumidæ. Folia 5·0–8·0 cm. long. (pleraque 6·5–7·5 cm., infima nonnunquam nec ultra 3·0 cm.), 1·5–3·0 cm. lat., plerumque vero 2·0–2·5 cm., tenuiter membranacea; costæ secundariæ utrinque circa 12, oblique ascendentes, levissime fornicatæ, inferiores approximatæ; petioli modo 0·2–0·4 cm. long., pubescentes. Spicæ 2·0–4·0 cm. long., solemniter 4–8-floræ, pedunculis saltem basi villosulo-pubescentibus 1·5–5·5 cm. long. insidentes. Bracteæ et bracteolæ ovato-lanceolatæ, breviter acuminatæ, puberulæ, circa 0·1 cm. long. Flores purpurei. Calycis 0·75 cm. long., lobi lineari-lanceolati, carinulati, puberuli. Corollæ tubus 0·53 cm. long.; labii antici, 0·7 cm. long., lobi oblongi, obtusi, 0·6 cm. long., 0·2 cm. lat.; labium posticum ovato-oblongum, 0·45 cm. long.; palatus vix inflatus. Antheræ circa 0·1 cm. long. Discus 0·05 cm. alt. Ovarium oblongum, glabrum, vix 0·15 cm. long., 0·75 cm. lat.; stylus pilosiusculus, 0·8 cm. long.; stigmatis lobus alter abbreviatus, alter oblongus, 0·03 cm. long. Capsulæ 1·5–1·8 cm. long. pars seminifera 1·0 cm. long.; valvæ acutatæ. Semina levia, margine fimbriolata, dilute brunea, 0·4 cm. diam., retinaculis obtusis suffulta.

Diantheræ obtusifoliæ (*Rhytiglossæ obtusifoliæ*, Nees) arcte affinis, sed ob habitum crassiorem, indumentum, et folia diversiformia vix ejus varietas. Itaque non dubito quin ad specimina Amazonica a cl. Spruce ad Santarem (n. 366) et a cl. Traill ad Montalegre (n. 652 in Hb. Kew.) lecta accedat, quâcum equidem vix conspecifica foliis latioribus et glabrioribus, spicis pauciusfloris et brevius pedunculatis, floribus minoribus, signisque aliis. [Bras. Or., Amazonia, Argentina, Guiana, Texas.]

Dianthera polygaloides (sp. nov.); caule humili, erecto, patenti-hirsuto, deinde pubescente vel puberulo; foliis integerrimis, subsessilibus, lineari-lanceolatis, utrinque acutatis, membranaceis, hirsutis, cito pilosis; floribus parvis, in spicas subdensi- et paucifloras, hirsutas pubescentesve, folia plerumque subæquantes dispositis; bracteis bracteolisque lineari-lanceolatis, calyce brevioribus; calycis lobis subæqualibus, lobo postico deficiente; corollæ tubo quam calyx breviore, faucibus paullulum ampliatis; labio postico attenuato, apice emarginato aut æquilongo; staminibus a labio postico bene superatis; antheris subæqualibus, loculo superiore transverso, inferiore basi obtuso vel mucronulato nec calcarato; disco cupulari, ore brevissime lobulato; stylo apice integro; capsulâ et seminibus haud visis.

Hab. Ad Santa Cruz floret mens. Nov. (N. 667.)

Rhizoma sat tenue, radices crebras parce fibrillosas, sæpe longe ac anguste tuberosas emittens; tubera usque ad 4·5 cm. long. et 0·3 cm. lat., pleraque vero breviores et

angustiores. Caules fere usque ad 20·0 cm. alt., modici vero circa 15·0 cm., subtetragoni; nodi inferiores approximati et folia hebetata perferentes. Folia 4·5–6·0 cm. long., 0·35–0·7 cm. lat., erecta, petiolis perbrevibus hirsutis insidentia; costæ secundariæ utrinque circa 5, erecto-ascendentes, parum conspicuæ. Spicæ usque ad 7·0 cm. long., sæpius vero circa 5·0 cm.; pedunculi plerique 1·5–3·0 cm. long., erecti. Bracteæ et bracteolæ hirsutulæ vel hirsuto-pubescentes; illæ 0·5 cm., hæ 0·4 cm. long. Flores purpurei, faucibus albo-striatis. Calyx 0·65 cm. long., hirsutulo-pubescens; lobi acutati, margine ciliati. Corollæ extus pubescentis tubus 0·4 cm. long., 0·2 cm. lat.; labia 0·6 cm. long.; labii antici lobi 0·3 cm. long., lobi laterales oblongi, intermedius late ovatus, omnes obtusi, plus minus crenulati; labium posticum oblongum, sursum angustatum; palatus bene prominulus. Filamenta omnino filiformia; antherarum loculi 0·1 cm. long., connectivo late sejuncti. Discus 0·03 cm. alt. Ovarium oblongum, vix 0·2 cm. long., sursum attenuatum, glabrum, in stylum 4-plo longiorem desinens.

A *Dietherâ angustifoliâ* (*Rhytiglossâ angustifoliâ*, Nees) satis distat ob plurima signa, nempe humilitatem, caulem hirsutum, folia disparia, calycis lobos ciliatos, flores minores, etc. [Goyaz.]

VERBENACEÆ.

LANTANA CAMARA, Linn. Sp. Pl. ed. I. p. 627.

Hab. Reperi ad Cuyabá, itaque ad Serra da Chapada. (Nn. 22, 128.) [Amer. Trop.]

LANTANA SCABRIDA (sp. nov.). Erecta, diffusa, caule sat gracili, tetragono, striato, scabriuscule puberulo, parumper glabro; foliis ovatis obtusis, e basi rotundatâ in petiolum brevem subito attenuatis, argute crenato-serratis, facie superiore scabridis, inferiore pubescentibus; pedunculis rectis, elongatis, tenuibus, folia excedentibus; capitulis abbreviatis paucifloris, pedunculis strictis folia excedentibus insidentibus; bracteis imbricatis, ovato-lanceolatis acutis, scabridis, margine ciliatis; calycis ore sinuato; corollæ tubo basi attenuato, medio ampliato, faucibus levissime coarctatis; limbo sub-bilabiato 4-fido; stigmate anguste ovato, laterali; drupâ ignotâ.

Hab. Crescit in ripâ fl. Paraguay juxta montem Pão d'Assucar, inter Coimbra et fl. Apa, ubi floret mens. Feb. (Nn. 1084, 1085.)

Frutex parvus, incertâ altitudine. Caulis 0·2 cm. diam., dein cinereus et subpolitus, internodia pleraque 4·0–6·0 cm. long. Folia usque ad 4·0 cm. long. (modica circa 2·5 cm.) et 2·0 cm. lat., firme membranacea, parum bullata, petiolis pubescentibus 0·4–0·8 cm. long. fulta. Pedunculi vix usque 5·0 cm. long., pubescentes. Capitula vix 1·0 cm. diam. Bracteæ exteriores 0·6–0·7 cm. long., 0·3–0·5 cm. lat.; interiores circa 0·5 cm. long., 5-nerves, membranaceæ. Flores albi. Calyx minute pubescens, 0·1 cm. long. Corollæ tubus extus et intus superne pubescens, alibi glaber, vix 0·5 cm. long., basi 0·04 cm. lat., ad staminum insertionem 0·8 cm. lat.; limbus extus pubescens, vix 0·3 cm. diam. Stamina 0·22 cm. ultra basin corollæ fixa. Ovarium ovoideum, 0·05 cm. long., stylo duplo longiore coronatum; stigma 0·02 cm. long.

Mihi videtur ad *Lantanam canescentem*, H. B. K., proxime accedere, sed foliis argutius dentatis, capitulis minoribus, calyce ampliore, corollæ tubo saltem duplo latiore, necnon labiis disparibus ab illâ certo abhorret. [Amer. Trop.]

LANTANA COIMBRENSIS (sp. nov.); caule erecto, ramoso, tetragono, appresse strigoso-pubescente, dein fere glabro; foliis ovato-lanceolatis acutis, basi in petiolum brevem subito attenuatis, membranaceis, serrulatis, paginâ superiore minute pubescentibus, inferiore minute pubescenti-tomentosis; capitulis plurifloris, pedunculis ascendentibus quam folia brevioribus vel ea subæquantibus suffultis; bracteis ovato-lanceolatis, breviter acuminatis, corollæ tubo paullo brevioribus; calycis anguste tubulosi ore sinuato; corollæ tubo e basi attenuatâ gradatim amplificato, faucibus parum constrictis, limbo sub-bilabiato 4-fido, stigmate ovato, laterali; capsulis non visis.

Hab. Inveni ad Coimbrá florentem mens. Feb. (N. 1076.)

Caulis 0·2–0·3 cm. diam., mox eminens et lenticellis punctiformibus crebris inspersus. Folia pleraque 2·0–5·0 cm. long., usque ad 2·0 cm. lat., margine inferne fere integro, interdum obscure serrulato. Pedunculi 1·5–4·5 cm. long., pubescentes. Capitula 0·8 cm. diam. Bracteæ usque ad 0·35 cm. long., 5–6-nerves, dense scabrido-pubescentes. Flores albi. Calyx 0·07 cm. long., pubescens. Corollæ tubus utrinque superne pubescens, inferne glaber, 0·4 cm. long., basi 0·02 cm. et ad staminum insertionem 0·06 cm. lat.; limbus 0·3 cm. diam., extus pubescens. Stamina 0·18 cm. supra basin corollæ fixa. Ovarium ovoideum, 0·5 cm. long.; stylus crassiusculus, vix 0·1 cm. long., stigmate ter longior.

Præcedenti affinis, sed foliis mollioribus et minus argute serratis, capitulis majoribus plurifloris, bracteis minoribus, calyce minus ampliato, corollæ tubo angustiore et limbo ampliore facili negotio distinguenda. [Amer. Trop.]

LIPPIA URTICOIDES, Steud. Nomencl. ed. II. ii. p. 54.

Hab. Crescit ad Santa Cruz, mens. Nov. florens. [Bras. Or., Goyaz, Peruvia, Bolivia.]

LIPPIA BETULÆFOLIA, H. B. K. Nov. Gen. et Sp. ii. p. 264.

Hab. Floret ad Santa Cruz mens. Oct. (Nn. 480, 480 *a.*) [Amer. Austr. Trop., Paraguaria.]

LIPPIA NODIFLORA, Rich in Michx. Fl. Bor.-Amer. ii. p. 15.

Hab. In paludibus ad Corumbá abundat. (N. 947.) [Late diffusa.]

LIPPIA VERNONIOIDES, Cham. in Linnæa, vii. p. 232.

Hab. Crescit ad Jangada, mens. Sept. florens. [Bras. Or.]

LIPPIA (§ ZAPANIA) JANGADENSIS (sp. nov.). Erecta, elata, appresse pubescens; caule valido, parce ramoso, subtereti, demum scaberulo; foliis oppositis, subsessilibus, oblongis vel oblongo-ovatis, acutiusculis, margine triente inferiore integris, inde plus minus crenato-serrulatis, membranaceo-coriaceis; capitulis paniculatis vel solitariis et axillaribus, si solitariis, plerumque longius pedunculatis; pedunculis ascendentibus,

dense pubescentibus; bracteis ovatis vel obovatis, breviter acuminatis, a floribus bene superatis, breviter luteolo-lanatis; calyce tubuloso, 2-lobo, lanato; corollæ tubo incurvo, inferne attenuato, superne satis ampliato; limbi lobo postico-integro; staminibus inclusis; antheris late ellipticis; stylo quam ovarium duplo longiore, superne incrassato; stigmate laterali; ovulis basalibus.

Hab. Incolit fruticeta ad Jangada, ubi mens. Sept. floret. (N. 280.)

Caulis deorsum 0·6 cm. diam., fistulosus, striatus; ramuli 0·2 cm. diam., tetragoni, haud fistulosi. Folia pleraque 3·0–5·0 cm. long., 1·0–2·0 cm. lat.; costæ secundariæ utrinque 4–5, basales margine parallelæ, reliquæ oblique ascendentes, levissime arcuatæ; petioli nec ultra 0·2 cm long., pubescentes. Pedunculi capitulorum solitariorum vix usque ad 4·0 cm. long., capitulorum paniculatorum haud 2·0 cm. attingentes. Capitula 0·7 cm. diam. Bracteæ modicæ vix 3·0 cm. long., intus leves, margine lanato-ciliatæ. Flores albi. Calyx membranaceus, 0·1 cm. long., alte divisus, lobis ovatis, obtusissimis, 2-nervibus. Corollæ tubus 0·25 cm. long., superne breviter lanatus; faucibus 0·05 cm. diam.; limbi lobus anticus elongatus, rotundatus, 0·08 cm. long.; lobi omnes, antico exempto, extus breviter lanati, intus, una cum faucibus, pubescentes. Stamina 0·15 cm. supra basin corollæ fixa. Ovarium ellipsoideum, obsolete puberulum, apice pilis brevibus albis coronatum; stigma stylo duplo brevius. Fructus ignotus.

Cum *Lippiâ vernonioidi*, Cham., rite componenda, cujus folia reverâ majora, firmiora, argutius dentata, spicæ majores, bracteæ itaque multo majores, corollæ grandioris tubus longe diversus, etc. [Bras. Or.]

Lippia lasiocalycina, Cham. in Linnæa, vii. p. 231.

Hab. Satis abundat passim in provinciâ, e. g. ad Cuyabá, Serra da Chapada et Santa Cruz, ubi *Esperanza* nuncupatur. (Nn. 19, 92, 300.) [Bras. Or., Goyaz, Bolivia.]

The popular name of this pretty plant is due to the fact of its flowering at the approach of the cool rainy season.

Lippia (§ Rhodolippia) primulina, (sp. nov.); caule e rhizomate magnopere incrassato, erecto, gracili, paucifolio, hirsuto-villosulo, demum pubescente; foliis parvis, subsessilibus late ovatis, obtusissimis, crenato-serratis, utrinque villoso-tomentosis; pedunculis erectis, folia excedentibus vel subæquantibus, hirsuto-villosulis; bracteis more sectionis latissimis rotundato-ovatis, brevissime cuspidatis, piloso-pubescentibus; calyce tubuloso, alte bilobo, albo-villoso; corollæ tubo parum incurvo, ad staminum insertionem satis amplo, faucibus paullulum attenuato, inferne vero insigniter coarctato; limbi lobo postico integro, antico reliquis majore; staminibus inclusis; antheris latis; stylo quam ovarium fere 4-plo longiore, stricte filiformi; stigmate laterali; ovulis basalibus.

Hab. Crescit in cacumine montium Serra da Chapada, mens. Aug. florens. (N. 189.)

Rhizoma 1·0 cm. crass., in sicco bruneum. Planta in toto nec ultra 20·0 cm. et caulis ipse 17·0 cm. alt., subteres, longitrorsum costatus, 0·2 cm. diam. Folia usque ad 2·5 cm. long. et 2·0 cm. lat., subcoriacea, subtus infra margines pilis carentia,

margine ciliata, penninervia vel palmatim 7-nervia. Pedunculi 2·5–4·0 cm. long., caule circa duplo tenuiores. Capitula vix 1·5 cm. diam. Bracteæ extimæ 1·1 cm., interiores circa 0·6 cm. long. et lat., utrinque piloso-pubescentes, plurinerves, margine ciliatæ. Flores punicei, faucibus luteis. Calycis, 0·15 cm. long., lobi quadrangulari-ovati, 2-nerves, intus leves. Corollæ tubus superne extus utrinque pubescens, 0·9 cm. long., medio vix 0·1 cm. diam.; limbi 1·0 cm. diam.; lobus anticus circa 0·6 cm. lat. Stamina circa 0·3 cm. supra basin corollæ inserta. Ovarium 0·06 cm. long., ovoideum, obsolete puberulum; stylus 0·22 cm. long., glaber; stigma ovario æquilongum.

Lippiæ Gardnerianæ, Schauer, proxima, et ab eâ distans staturâ humiliore, foliis villoso-tomentosis nec pubescenti-hirtis, bracteis minoribus pubescentibus, aliisque signis.

Hujus speciei varietatem legit beat. Gardner prope Duero in provinciâ Goyazensi, a typo discrepantem imprimis ob bracteas minores (0·65 cm. long. et lat.) et stylum crassiusculum, ovarium modo duplo excedentem. Var. *goyazensis*, nob. (N. 3406 in Herbb. Brit. Mus. et Kew.) [Goyaz.]

Baillonia amabilis, Bocq. in Adansonia, ii. p. 251 (ex icon. et descript.).

Hab. Reperi ad Coimbrá florentem mens. Feb. (N. 1067.)

Hitherto the late Dr. Weddell has been the only collector of this interesting plant in its wild state. Although Bocquillon unfortunately omits measurements, I presume that my specimens are referable to the same species as Weddell's, seeing that not only do they closely agree with Bocquillon's figure and description, but they were collected in the same neighbourhood.

In the ‘Genera Plantarum’ this genus has, unfortunately, been thoroughly misunderstood. A few years after the publication of Bocquillon's paper, the late Mr. Miers established a genus *Diostea* (Trans. Linn. Soc. xxvii. p. 102) to include, besides the South-American Verbenaceæ considered by Hooker and Gillies as species of *Verbena* (*V. scoparia* and *V. juncea*, Hook. et Gill.), a few others from the same part of the world, the chief point of difference from *Verbena* lying in their possession of a fruit consisting of two 1-seeded, somewhat fleshy pyrenes, instead of a couple of dry pyrenes, each with two seeds. This genus *Diostea*, at least so far as concerns *D. juncea*—the other species being relegated to *Verbena*—is merged with *Baillonia* in the ‘Genera Plantarum’ (ii. p. 1143), which latter genus is considered to be “perhaps too near *Lippia*.” Had specimens been available when the ‘Genera Plantarum’ was written, the most cursory inspection would have sufficed to show that *Baillonia* of Bocquillon is quite different both from *Diostea* on the one hand, and from *Lippia* on the other. Moreover the remark, concerning *B. amabilis*, Bocq., “ex icone et descr. quoad folia et inflorescentiam simillima est *Lippiæ citriodoræ*,” would certainly never have been penned; for, beyond the fact that both plants belong to the same tribe of Verbenaceæ, they have absolutely nothing in common.

To show how different *Baillonia* is from *Diostea*, I have constructed the following table, from my own observations with the exception of the fruit, details concerning which are taken from the figures and descriptions of Bocquillon and Miers:—

	Baillonia.	*Diostea.*
Branches	Spiny on falling off of leaves.	Not spiny after leaf-fall.
Leaves	Long, narrow, coriaceous, frequently subopposite or alternate, more rarely sub-verticillate.	Small and membranous, and strictly opposite.
Inflorescence	Racemose.	Spicate.
Calyx	Relatively short and campanulate, with undulate margin.	Comparatively long and tubular, with distinct lobes.
Corolla	With a straight, short, broad tube, and a large limb.	With a narrow, elongated, curved tube, and small limb.
Style and stigma	Short fleshy style, with a large capitate stigma.	Long slender style, with a linear recurved stigma.
Fruit	Comparatively large entire pyriform fruit, surrounded at base by remains of calyx; mesocarp fleshy, endocarp very long.	Small 2-lobed fruit completely enclosed in the persistent calyx; scarcely any mesocarp, thin endocarp.

Perhaps the most remarkable point about *Baillonia* is the curious nature of its spines. These seem to be branches which, instead of separating from their mother branch, remain attached to it, except for a small projecting flange at the top, upon which flange the leaf is borne. After fall of the leaf, the flange remains permanently as a strong, sharp, straight spine. Adhesions, possibly of branches to their parent branch, occur in some other Verbenaceæ, *e. g.* in *Diostea* itself, in *Symphorema*, in some species of *Avicennia*, in *Premna*, *Petræa*, and *Citharexylum*; while in *Volkameria*, and to some extent in *Citharexylum*, spines are left after leaf-fall, as occurs with *Baillonia*. Although placed in different tribes of Verbenaceæ, one cannot fail to be struck with the evident affinity of *Baillonia* to *Citharexylum*. The habit, the racemose inflorescence, and the flowers of both are very similar; in its 2-seeded fruit alone does *Baillonia* show any marked difference.

Bocquillon's description may be fitly supplemented with the following notes:—

Caulis in sicco albidus, teres, longitrorsum eximie striatus, circa 0·5 cm. diam., spinis ramalibus 0·2 cm. long. munitus. Folia usque ad 20·0 cm. long. et modo 1·0 cm. lat. (mediocria 15·0 cm. × 0·6 cm.). Racemi circa 15·0 cm. long.; pedicelli 0·2 cm. attingentes. Flores albi. Calyx 0·3 cm. long., 0·25 cm. lat. Corollæ tubus 0·6 cm. long., 0·25 cm. lat.; limbus 0·8 cm. diam.

Eandem plantam legit cl. Balansa in Paraguariâ. (N. 2089 in Herb. Kew.)

Balansa's specimens were obtained from gardens at Asuncion; there is, therefore, at present no evidence that the genus occurs wild out of the tropics. [Matto Grosso.]

STACHYTARPHETA DICHOTOMA, Vahl, Enum. i. p. 207.

Hab. Vulgatissima in montibus Serra da Chapada, ad Santa Cruz, et alibi in provinciâ. Nom. vernac. *Gerboa.* (N. 86.)

Medicamentum efficax contra epilepsiam, itaque in tussibus sanandis nequaquam spernendum, præbere dicitur. [Amer. Trop., Paraguaria.]

VERBENA (§ VERBENACA) ARISTIGERA (sp. nov.). Vix semimetralis, ramulis e caule procumbente assurgentibus erectis, tetragonis, appresse et strigose pubescentibus, dein puberulis; foliis oppositis petiolatis pinnatifido-trisectis, appresse et strigose pubescentibus, segmentis linearibus mucronatis rigidis; spicis densifloris, abbreviatis, deinde elongatis, strigose pubescentibus; calycis alte tubulosi dentibus elongatis aristiformibus, patentibus; corollæ tubo calycem bene superante leviter curvato, sursum paullulum amplificato; lobis obovato-oblongis retusis; antherarum omnium connectivo apice inappendiculato; ovario apice subintegro, stylo elongato ovarium magnopere excedente.

Hab. Crescit prope montem Pão d'Assucar dictum, inter Coimbrá et fl. Apa, ubi inveni mens. Feb. florentem. (N. 1083.)

Planta circa 40·0 cm. alt. Caulis basi procumbens, usque ad 4·0 cm. diam., lignosus, late ac tenuiter rimosus, nodis parum tumidis; ramuli 0·2 cm. diam., obsolete striati; internodia pleraque 4·0–4·5 cm. long. Folia circa ad 3·5 cm. long. et 4·0 cm. lat., exstant vero minora, firma; petioli usque ad 1·0 cm. long. subalati; segmenta longitudine variâ, usque ad 1·0 cm. sæpe falciformi-curvata, lineari-subulata, nec ultra 0·1 cm. lat. Spicæ primo 1·5 cm. long. et lat., deinde usque 7·0 cm. elongatæ; pedunculus juvenilis circa 1·5 cm., deinde usque 6·0 cm. attingens. Bracteæ rigidiusculæ, subulatæ, 0·4 cm. long., ascendentes, strigose pubescentes. Flores purpurei. Calycis fructiferi immutati tubus 0·6 cm. long., 0·07 cm. lat., dentibus angustissimis, 0·2–0·3 cm. long., coronatus. Corollæ tubus paullo ultra 1·0 cm. long., basi 0·1 cm., faucibus vix 0·2 cm. lat., intus ad staminum insertionem hirsutus, alibi puberulus; lobi 0·3–0·35 cm. long., circa 0·2 cm. lat. Stamina breviora 0·8 cm. supra basin corollæ inserta; filamenta antheris linearibus acutis paullo breviora. Ovarium glabrum, 0·5 cm. long; stylus 0·9 cm. long., minute puberulus, apice paullulum incurvus. Pyrena parum inæqualis, linearis; ochraceæ longitrorsum costulatæ, minute scrobiculatæ, quater longiores quam latæ, usque 0·2 cm. long.

A *V. crinoidi*, Lam., cui sat similis ob calycis dentes longe ac patule aristatos necnon antherarum connectivum eglandulosum, nullo negotio agnoscenda. [Bras. Or., Peruvia, Chili, Argentina.]

CASSELIA MANSOI, Schauer in Mart. Fl. Bras. ix. p. 175.

Hab. Crescit ad Santa Cruz. (N. 768 *a.*) [Matto Grosso.]

VITEX CYMOSA, Bertero, ex Spreng. Syst. Veg. ii. p. 757.

Hab. Ad Jangada simul flores ostendit et folia enascentia mens. Sept. (N. 278.)

Arbor copiose ac valide ramosa, circa 12-metralis; truncus circa 7-metralis diam., cortice griseo longitrorsum fisso obductus. Corolla parum suaveolens, cyanea, faucibus albis.

Florum decoctum stomachi cruditati mederi narrabant incolæ.

This tree yields the "Taruma" fruit, about the size of an olive, cultivated at Asuncion. [Bras. Or., Amazonia, Bolivia, Paraguaria.]

LABIATÆ.

OCIMUM CANUM, Sims, Bot. Mag. t. 2452.

Hab. Floret ad Santa Cruz mens. Nov. (N. 665.) [In tropicis utriusque orbis late diffusa.]

OCIMUM MICRANTHUM, Willd. Enum. p. 630.

Hab. Reperi ad Santa Cruz, mens. Nov. florentem. (N. 660.) [Amer. Trop.]

PELTODON PUSILLUS, Pohl, Pl. Bras. Ic. i. p. 67.

Hab. Crescit in cacumine montium Serra da Chapada, mens. Aug. florescens. (N. 182.) [Bras. Or., Goyaz.]

HYPTIS RECURVATA, Poit. in Ann. Mus. Paris, vii. p. 467.

Hab. Crescit inter Cuyabá et Serra da Chapada, itaque ad Santa Cruz, mens. Aug.–Sept. florens. (Nn. 56, 303.) [Amer. Trop.]

HYPTIS MICROPHYLLA, Pohl, ex Benth. Lab. p. 82.

Hab. Ad Santa Cruz inveni mens. Dec. (N. 797.) [Bras. Or., Venezuela.]

HYPTIS BRUNNESCENS, Pohl, ex Benth. Lab. p. 82.

Hab. Crescit ad Cuyabá, mens. Aug. florens. (N. 35.) [Goyaz.]

Flores columbini.

HYPTIS CRENATA, Pohl, ex Benth. Lab. p. 93.

Hab. Frequens ad Cuyabá, et in montibus Serra da Chapada. (Nn. 18, 147.) [Bras. Or., Goyaz, Bolivia.]

Flores nunc albi, nunc columbini.

HYPTIS IMBRICATA, Pohl, ex Benth. Lab. p. 98.

Hab. Floret mens. Oct. ad Santa Cruz, ubi *Ortelan* nuncupatur, et in remediorum antirheumaticorum numero habetur. (N. 644.) [Bras. Or., Goyaz, Bolivia.]

HYPTIS BREVIPES, Poit. in Ann. Mus. Paris, vii. p. 465.

Hab. In paludibus prope Corumbá mens. Jan. floret. (N. 1003.) [In tropicis utriusque orbis late diffusa.]

HYPTIS SPICATA, Poit. in Ann. Mus. Paris, vii. p. 474.

Hab. Reperi juxta Corumbá mens. Jan. (N. 902.) [Amer. Trop.]

HYPTIS (§ PANICULATÆ) EFFUSA (sp. nov.); caule elato e rhizomate robusto assurgente, gracili, obsolete tetragono, dense fulvo-tomentoso, deinde glabro vel puberulo; foliis amplis vel parvis, petiolatis, oblongis obtusis acutisve, basi obliquis, aliquatenus rotundatis, margine impariter crenato-serratis, membranaceis supra scabridis, subtus molliter tomentosis, dein pubescentibus; paniculis maxime effusis, folia multoties excedentibus, ramulis patentissimis; floribus parvis, pedicellis capillaceis elongatis patulis; calycis campanulati, in medio parum constricti, dentibus triangulari-lanceolatis acutis, ore recto; corollæ tubo, calycem paullulum excedente, superne leviter ampliato, lobo antico integro; disco antice haud tumente, nuculis oblongis lævibus exalatis.

Hab. Crescit ad Serra da Chapada, ubi floret et fructificat mens. Aug. (N. 159.)

Frutex orgyalis vel etiam ultra, sursum solummodo foliatus. Rhizoma crassum, abundanter radiciferum. Caulis 0·25 cm. diam., cortice cervino crebro striato cinctus. Foliorum lamina usque ad 10·0 cm. long. et 4·0–5·0 cm. lat., minora vero (circa 2·0×1·0 cm.) satis abundant; costæ secundariæ utrinque circa 9, angulis latis raro opposite insertæ, leviter arcuatæ. Costæ et venulæ subtus eminentes, hæ laxe reticulatæ. Paniculæ interdum 30·0 cm. long. et diam., patentissimæ, ramulis gracillimis, glabris. Pedicelli plerique 0·5–1·5 cm. long. Bracteolæ sub floribus sitæ, exiguæ, subulatæ, 0·08 cm. long. Flores purpurei. Calyx floris aperientis vix 0·3 cm. long., ultra $\frac{1}{3}$ divisus, arcte pubescens. Corolla tota 0·5 cm. long., extus pubescens; tubus 0·3 cm. long., vix 0·1 cm. lat.; limbus 0·35 cm. diam.; lobi oblongi, obtusi, circa 0·18 cm. long. Stamina breviter exserta, faucibus affixa; filamenta pilosa, circa 0·1 cm. long.; antheræ reniformes, 0·08 cm. lat. Nuculæ 0·3 cm. long., fusco-purpureæ, basi albidæ, calyce 0·55–0·8 cm. long., 0·25–0·3 cm. lat., eximie reticulato-nervoso, subnitido inclusæ.

Juxta *H. reticulatam*, Mart., intercalanda, abs quâ ob pedicellos capillaceos, calycem minorem, angustiorem, medio parum coarctatum, necnon flores minores, facili negotio secernere potes. [Bras. Or.]

HYPTIS GLAUCA, A. St.-Hil. ex Benth. Lab. p. 141.

Hab. Ad Cuyabá mens. Aug. flores præbet. (N. 23.) [Bras. Or., Goyaz.]

ERIOPE CRASSIPES, Benth. Lab. p. 144.

Hab. Crescit ad Serra da Chapada. (N. 196.) [Bras. Or., Goyaz.]

LEONOTIS NEPETÆFOLIA, R. Br. ex Benth. in DC. Prod. xii. p. 535.

Hab. Crescit ad Jangada, itaque prope Corumbá. (Nn. 285, 978.) [Late diffusa.]

MONOCHLAMYDEÆ.

NYCTAGINEÆ.

Neea hermaphrodita (sp. nov.) (Tab. XXVIII. figg. 1–4.) Fruticosa, caule terete, fulvo-tomentoso, mox pubescente, dein pæne glabro; foliis breviter petiolatis, oblanceolato-oblongis obtusis, interdum breviter vel brevissime cuspidatis, basi obliquis, supra, costâ medianâ plus minus fulvo-tomentosâ vel pubescente exemptâ, minute puberulis, indumento cito obsoleto, subtus, præsertim in nervis, rufo-tomentello-pubescentibus, cymis divaricato-ramosis, laxifloris, pedunculis quam folia brevioribus rufo-tomentosis; bracteolis mediocribus subulatis, floribus hermaphroditis, perigonio urceolato puberulo, stylo incluso.

Hab. Crescit ad Santa Cruz, ubi mens. Oct. flores præbet. (N. 481.)

Frutex altus, biorgyalis, habitu diffuso. Ramuli graciles, 0·2–0·4 cm. diam., puberuli et cortice leucophæo reticulato-striatulo, lenticellis prominentibus plus minus instructo, obducti. Folia obsolete undulata, plerumque 5·0–8·0 cm., raro 9·5 cm. attingentia, rarissime ad 2·0 cm. vel infra imminuta, juvenilia tenuiter membranacea, siccitate nigricantia, mox membranaceo-coriacea; costæ secundariæ angulo lato costæ mediæ insertæ, sub margine arcuatim connexæ, costulis in reticulum laxum conjunctis; petioli 0·3–0·5 cm. long., rufo-tomentelli. Pedunculi plerique 2·0–4·0 cm. long., erecti. Cymæ circa 4·0 cm. diam., rufo-tomentellæ. Bracteolæ circa 0·1 cm. long. Flores omnes a me scrutati hermaphroditi, virescentes. Perigonia 0·5–0·6 cm. long. 0·25 cm. lat., siccitate mox nigricantia; dentes 0·1 cm. long. triangulares, acuti. Alabastra acuta. Stamina 8; filamenta basi ampliata, longiora 0·3, breviora 0·1 cm. long.; antheræ 0·12 cm. long. Ovarium compressum, ambitu ovatum, 0·1 cm. long.; stylus inclusus, ovarium duplo superans, curvatus; stigma acutum. Fructus ignotus.

Species forsan cum *N. pubescente*, Poepp. et Endl., componenda, cujus specimen authenticum non vidi, quæ ramorum apicibus glabris, foliis supra glaberrimis longius petiolatis, venulis subobsoletis, perigonio tubuloso rubro nec virescente gaudet. Affinior videtur plantæ a cl. Spruce lectæ (N. 1103), sed distat indumento dispari, cymis plurifloris, forsitan floribus hermaphroditis, etc. [Amazonia.]

AMARANTHACEÆ.

Pfaffia vana (sp. nov.); caule fistuloso, diffuso, ramoso, minute puberulo; foliis brevipetiolatis, lanceolatis, acuminatis, basi rotundato-attenuatis, membranaceis, præsertim facie superiore appresse pubescentibus; capitulis minimis, pedunculos solitarios, elongatos, pubescentes, foliis circa duplo breviores coronantibus; perianthii bracteis 4-plo longioris foliolis lineari-oblongis, sub apice subito coarctatis, obtusiusculis, firmis, viridibus; staminibus paullo supra medium connatis; filamentis late linearibus, abrupte truncatis, ciliatis; antheris breviter stipitatis; ovario subsphæroideo ab andrœcio superato.

Hab. Crescit ad Santa Cruz, ubi mens. Oct. floret. (N. 654.)

Caulis subteres, leviter undulatus, striatus, ad nodos tumidus et pilosulus; ramuli ad angulum rectum vel fere rectum ramo inserti, recti vel parum arcuati, nodis distantibus (internodia haud raro 8·0–10·0 cm. long.). Folia ad 7·0 cm. long., pleraque 1·3–2·0 cm. lat., basin versus amplificata, siccitate haud nigricantia; petioli 0·5–0·8 cm. long. Pedunculi arrecti, 2·5–3·0 cm. long. Capitula ovoidea, 0·5–0·8 cm. long., 0·4–0·5 cm. lat.; axes albido-pubescentes. Perianthii foliola, vix 0·2 cm. long., subcarinato-trinervia, basi albide pilosa, ceterum pilosula. Andrœcium 0·1 cm. long. Ovarium 0·06 cm. long. Stigma capitatum, sessile, obsolete lobulatum.

Affinis *Pfaffiœ glaucœ* (*Sertuerneræ glaucæ*, Mart.), optime vero secernendade pedunculis solitariis, capitulis minoribus, floribus minoribus et comparative latioribus, sepalis conspicue viridi-nervosis, staminibus altius connatis, itaque ovarium *P. glaucæ* ovoideum nec subsphæroideum. [Bras. Or., Goyaz, Guiana, Peruvia, Argentina.]

TELANTHERA (§ BRANDESIA) GENICULATA (sp. nov.). Diffusa, ramis patulis, geniculatis, teretibus, pubescentibus, cito puberulis; foliis petiolatis, ovato-lanceolatis, breviter acuminatis, basi obtusis, membranaceis, præsertim paginis inferioribus minute pubescentibus, dein glabris; capitulis parvis, subsphæroideis, paucifloris; pedunculis plerisque quam folia brevioribus, tenuibus, pubescentibus; perianthii subteretis foliolis, bracteam et bracteolas circa 3-plo excedentibus, oblongis, obtusis, concavis, trinervibus, membranaceis, interioribus quam exteriores paullo minoribus; tubo stamineo 10-fido, staminodiis quam filamentum ⅓-plo longioribus, erosis; antheris oblongis; ovario globoso, apice truncato, in stylum brevem subito desinente.

Hab. Florebat prope Corumbá mens. Jan. (N. 1093.)

Caulis prasinus, haud fistulosus, ad nodos tumidus. Folia raro late ovata et tunc obtusissime vel brevissime biloba, modica 2·5–3·5 cm. long. et 1·5 cm. lat., membranacea, in sicco subnigricantia; petioli patuli, 0·5–1·0 cm. long., pubescentes. Capitula 0·6 cm. long., 0·7 cm. lat., pedunculis plerumque 0·5–2·5 cm. long.; capituli evoluti axis 0·5 cm. long., 0·3 cm. lat., post florum lapsum bracteis et bracteolis pubescentibus dilute bruneis dense instructus. Perianthii foliola 0·3 cm. long., exteriora 0·13 cm. lat., in sicco plus minus plane viridi-lutescentia, extus, præsertim inferne, pubescentia, firma. Tubus stamineus 0·1 cm. long.; staminodia tubo subæquilonga, linearia, 0·13 cm. long., marginibus integra, apice solummodo lacerato-erosa; filamenta subulata; antheræ 0·1 cm. long. Ovarium 0·03 cm. long. Stylus ovario æquilongus.

A proximâ *T. puberulâ*, Moq., abhorret, præter alia, foliis disparibus, multo minoribus, et perianthii foliolis majoribus et diversiformibus. [Bras. Or.]

ALTERNANTHERA PARONYCHOIDES, A. St.-Hil. Voy. Bras. ii. p. 439.

Hab. Frequens et gregaria in rivis cœnosis fl. Paraguay ad Corumbá. (N. 946.) Amer. Trop.]

Gomphrena Mariæ (sp. nov.); caule abbreviato, appresse piloso-villosulo, dein piloso vel glabro; foliis basi latâ insidentibus oblongo-lanceolatis, acutis, præsertim paginis inferioribus plus minus appresse pilosis; capitulis terminalibus, longipedunculatis, raro subsessilibus, depresse subsphæroideis; perigonii bracteas laterales anguste cristatas subæquantis foliolis anguste lineari-lanceolatis acuminatis, tribus exterioribus deorsum, interioribus toto dorso albido-villosis; fructu ignoto.

Hab. Crescit ad Villa Maria, mens. Dec. flores proferens. (N. 846.)

Subspithamea, caule repente in nodis tumido, erecto. Folia 1·5–3·0 cm. long., 0·5–0·7 cm. lat., apice acute mucronulata, floralia ovata vel ovato-lanceolata, acuta vel acuminata, capitulis paullo breviora, obsolete pilosula. Pedunculi modici circa 2·5 cm. long. (sed 4·5 cm. attingere possunt), rarissime ad 0·2 cm. reducti. Capitula ad 1·0 cm. long. et 1·3 cm. diam., juvenilia ovoidea, rhachide villosâ. Bracteæ subflorales quam laterales multo breviores, triangulari-ovatæ, acuminatæ, inferne dorso villosæ, 0·27 cm. long., concavæ. Bracteæ laterales 0·7 cm. long., iis *G. hygrophilæ* similes nisi longius acuminatæ et crista dorsali angustiore modo 0·075 cm. lat. instructæ. Flores 0·6 cm. long., rosei. Perigonii foliola 0·5 cm. long. Tubus stamineus perigonii foliolis æquilongus, 0·05 cm. lat., deorsum paullo ampliatus. Staminodia minuta, subulata; antheræ anguste lineares, 0·5 cm. long.

G. hygrophilæ, Mart., arcte affinis, species propria videtur esse ob indumentum, perigonii bracteas laterales longius acuminatas et angustius cristatas, præsertim vero ob tubum stamineum perigonium haud excedens. [Matto Grosso.]

Gomphrena glauca, Moq. in DC. Prod. xiii. 2, p. 384.

Hab. Inveni in ripâ fl. Cuyabá prope Melgaço. (N. 2.) [Bras. Or., Goyaz, Guiana, Peruvia, Argentina.]

PHYTOLACCACEÆ.

Petiveria alliacea, Linn. Sp. Pl. (ed. I.) p. 342.

Hab. Crescit ad Corumbá, itaque juxta Coimbrá, menss. Jan. Feb. florens. (Nn. 976, 1090 *a*.) [Amer. Trop.]

POLYGONEÆ.

Polygonum acuminatum, H. B. K. Nov. Gen. et Sp. ii. p. 178.

Hab. Ad ripam fl. Paraguay, juxta Santa Cruz, inveni mens. Nov. (N. 599.) [Amer. Trop.]

Polygonum acre, H. B. K. Nov. Gen. et Sp. ii. p. 179.

Hab. Santa Cruz; mens. Dec. floret. (N. 783.) [In Americâ late diffusa.]

Triplaris formicosa (sp. nov.). (Tab. XXVIII. figg. 5–6.) Arbuscula gracilis, ramis subteretibus, cortice obscure striato, bruneo, saltem in sicco longitrorsum rimoso; foliis amplis, ovatis, superne angustatis, basi rotundatis, petiolis manifestis; paniculis folia subæquantibus fulvo hirsuto-tomentosis, bracteis persistentibus; calycis

tubo oblongo-ovato, utrinque piloso-hirsuto, sinubus paullo intrusis, haud plicatis; lobis exterioribus oblanceolatis, uninervibus, laxe reticulato-nervosis, puberulis, interioribus hypogynis, anguste lineari-oblanceolatis, puberulis, nuculâ duplo brevioribus; nuculâ quam calycis tubus paullo breviore, breviter acuminatâ, faciebus ovatis lævibus nitidissimis.

Hab. Inveni passim crescentem in ripâ fl. Paraguay prope Santa Cruz. (N. 301.)

Rami sub inflorescentiâ 1·0–1·2 cm. diam., subnitidi, lenticellis paucis elevatis vel planis. Folia 25·0–29·0 cm. long., 13·5 cm. lat., firme membranaceo-coriacea, more generis longitrorsum striata, margine obsolete undulata, puberula; costæ laterales utrinque circa 20 fere rectæ, dein sub margine subito arcuatim junctæ; venulæ undulatæ, laxe reticulatæ; costæ et venulæ paginæ inferioris eminentes; petioli 0·2 cm. long., 0·6 cm. lat., anguste alati, facie superiore astricti. Inflorescentia circa 20·0 cm. long., patula. Bracteæ ovatæ, circa 0·5 cm. long., extus hirsuto-tomentosæ, intus castaneæ. Flores non suppetebant. Calyx fructifer 3·1–3·3 cm. long.; tubus 1·0 cm. long., medio 0·4 cm., sub lobis 0·25–0·3 cm. lat.; lobi exteriores erecti, medio 0·5 cm. long., lobi interiores 0·45 cm. long., 0·05 cm. lat., margine revoluti, apice recurvi. Nucula stylis diu persistentibus coronata, acuta, triquetra, 0·8 cm. long., ejus acumen vix 0·2 cm. long.

Ex affinitate *Triplaridis brasilianæ*, Cham., cujus calyx fructifer modo 2·2 cm. long., tubus ovatus et lobi breviores ac latiores quam ii plantæ nostræ, quæ distat etiam signis aliis levioris momenti. Hujus arboris medullam formicæ semper excavant et caules incolunt. [Bras. Or.]

TRIPLARIS, sp. Arbor altitudine prætermissâ; ramulis glabris, cinereis; foliis ovato-oblongis obtusis, basi obliquis, plerisque 10·0–13·0 cm. long., 5·0–6·0 cm. lat., coriaceo-membranaceis, supra appresse pilosis, subtus, præsertim in nervis, pubescentibus; paniculæ ramis florumque masculorum calycibus villoso-tomentosis; floribus femineis et fructibus ignotis.

Hab. Inter Villa Maria et Corumbá in ripâ fl. Paraguay mens. Dec. flores masculos ostendebat. (N. 1020 *a.*)

Forsan ad *T. tomentosam*, Wedd., accedens, sed ob specimina manca non sine dubio cum illâ componenda.

COCCOLOBA POLYSTACHYA, Wedd. in Ann. Sc. Nat. Bot. 3me série, xiii. p. 261. Var. MOLLIS.

Hab. Ad Jangada et juxta Santa Cruz floret et fructificat menss. Sept.–Oct. (Nn. 254, 369.)

Arbor parva, circa 4-metralis; ad Jangada vero, ex schedulâ meâ, frutex altus $2\frac{1}{2}$-metralis. Flores albi. [Bras. Or., Goyaz, Amazonia, Guiana.]

COCCOLOBA CUJABENSIS, Wedd. in Ann. Sc. Nat. Bot. 3me série, xiii. p. 259.

Hab. Ad Corumbá fructificat mens. Jan. (N. 999 *a.*) [Matto Grosso.]

COCCOLOBA (§ EUCOCCOLOBA) LONGIPES (sp. nov.); ramulis vix puberulis, ochreis amplis, novellis obscure puberulis; foliis oblongo-ovatis acutis vel breviter acuminatis, basi cordatis; costis secundariis supra eminentibus; venulis utrinque eminentibus, arctissime reticulato-nervosis, parumper omnino glabris; inflorescentiæ nodulis 1–2-floris; rhachide sub lente minutissime puberulâ, ochreolis minutis; pedicellis gracilibus ochreolam longe superantibus.

Hab. Legi ad Santa Cruz, ubi mens. Nov. flores et fructus præbet. (Nn. 565, 577.)

Rami et ramuli cinerei vel purpureo-fusco-cinerei, in longitudinem rimosi, subnitidi, glabri vel fere glabri. Ochreæ circa 0·5 cm. long., plerumque apice breviter laceratæ, firmæ, politæ, interdum nervosæ, persistentes. Petioli 0·5–2·5 cm. long., ad basin ochreæ inserti, crassiusculi, minutissime puberuli; folia usque ad 13·0 cm. long. et vix 7·0 cm. lat., minora vero exstant (e. g. 6·5 cm. long.), novella tenuia cito chartacea et paginâ inferiore nitidissima, demum coriacea et utrinque pallide nitentia, subtus pallidiora, margine cartilagineo interdum paullo revoluto, nervis lateralibus angulo circa 75° abeuntibus, aperte arcuatis. Inflorescentia terminalis, racemosa, 4·0 cm. long., sub fructu ad 8·0 cm. long., laxiflora, pedunculo circa 0·5 cm. long. insidens. Bracteæ lanceolatæ, circa 0·07 cm. long. Ochreolæ bracteas subæquantes. Pedicelli circa 0·35 cm. long., sub fructus plerumque 0·6 cm. patentes. Flores dilute virides. Perianthii tubus brevissimus; lobi inæquales, 0·2 cm. long., ovati vel ovato-orbiculares, in anthesi erecti. Filamenta complanata, sursum paullo attenuata, 0·2 cm. long., erecta; antheræ exsertæ. Ovarium oblongum, sursum leviter coarctatum, trigonum, 0·1 cm. long., stylis 3 coronatum. Fructus ovoideus, apice lobis perianthii instructus, totus 0·6 cm. long., 0·4 cm. diam. Nux triquetra, polita.

Planta verisimiliter cum *C. laxiflorâ*, Lindau, conferenda, cujus spicæ laxifloræ etsi multo breviores, et ochreolæ minutæ et pedicelli elongati, folia vero omnino alia, et flores divergunt. Habitus itaque *C. laxifloræ* minus robustus, et ochreæ adpressæ nec amplæ et evanidæ. [Bras. Or.]

COCCOLOBA PARAGUARIENSIS, Lindau, in Engl. Jahrb. xiii. p. 218.

Hab. Crescit ad Puerto Pacheco, mens. Feb. florens. (N. 1049.) [Paraguaria.]

COCCOLOBA (§ CAMPDERIA) SARMENTOSA (sp. nov.); ramulis glabris, ochreis adpressis glabris; foliis parvis ovatis vel lanceolatis obtusis, basi paullo angustatis, brevissime cordatis; costis secundariis et venulis laxe reticulatis, utrinque eminentibus; inflorescentiæ nodulis 1-floris, rhachide dense ac minute pubescente; pedicellis florum ochreolam vix æquantibus; fructibus ovoideis obtusis, lobis perianthii ei arcte adpressis.

Hab. Inveni ad Corumbá mens. Jan. (N. 1038.)

Frutex altus, altitudine prætermissâ, copiose ramosus, ramulis purpureo-cinereis striatis, lenticellis magnis parce adspersis. Ochreæ circa 0·3–0·6 cm. long., mox evanidæ. Petioli 0·5–0·8 cm. long., juxta basin ochreæ inserti, tenues, erecti, rufo- vel pallide

fulvo-tomentosi; folia 3·0–8·0 cm. long., modica circa 2·0–3·0 cm. lat., supra, præsertim in nervis, minute pubescentia, subtus pubescentia et in nervo mediano tomentella, membranaceo-coriacea, in sicco virescentia, subtus pallidiora; costæ secundariæ sub margine subito arcuatæ. Inflorescentia terminalis, racemosa, solitaria, foliis longior, plerumque 5·0–7·0 cm. long., multiflora, nodulis 1-floris; pedunculo 0·1 cm. long. et rhachide pubescentibus. Bracteæ late ovatæ, acutæ, circa 0·12 cm. long., dorso puberulæ, fere omnino membranaceæ. Ochreolæ bilobæ, bracteas paullo excedentes, membranaceæ. Flores albi. Perianthii tubus brevissimus; lobi late ovati, obtusissimi, 0·2 cm. long. Filamenta brevissima, antheras inclusas longitudine non excedentia. Ovarium oblongo-ovoideum, subacute trigonum, 0·12 cm. long. Styli 3, ovario 5-plo breviores. Fructus, calyce haud exempto, 0·7 cm. long., vix 0·5 cm. diam., pericarpio crustaceo purpureo-fusco.

Videtur *Coccolobâ paraguariensi*, Lindau, affinis, abhorrens vero foliis pubescentibus, rhachide pubescente, pedicellis ochreolas subæquantibus, bracteis ovatis, et pluribus signis aliis. [Paraguaria.]

PIPERACEÆ.

Piper orthostachyum, C. DC. in DC. Prod. xvi. 1, p. 247.

Hab. Crescit ad Corumbá, ubi mens. Jan. amenta ostendit. (N. 960.) [Bras. Or., Ind. Occ.]

Piper geniculatum, Sw. Prod. Fl. Ind. Occ. p. 15.

Hab. Inveni in nemorosis ad Santa Cruz mens. Sept. florentem. (N. 311.)

Frutex diffusus, vix trimetralis. [Amer. Trop.]

Piper asperifolium, Ruiz & Pav. Fl. Peruv. i. p. 37.

Hab. Reperi ad ripam rivuli in ascensu montium Serra da Chapada mens. Aug. (N. 123.)

Frutex circa trimetralis, caule basi circa 2·0 cm. diam., deorsum aphyllo. [Bras. Or., Amazonia, Peruvia, Guiana, Ins. Trinitatis.]

Piper tuberculatum, Jacq. Ic. Pl. Rar. ii. p. 2.

Hab. Frutex bimetralis viget in ripâ fl. Jangada, mens. Sept. florens. (N. 266.) [Amer. Trop.]

Peperomia nummularifolia, H. B. K. Nov. Gen. et Sp. i. p. 66.

Hab. Abundat ad Santa Cruz, in sylvâ primævâ inter Santa Cruz et Tapirapuan, et alibi. (N. 339.) [Amer. Trop.]

Peperomia, sp. Planta circa 15 cm. long. in sicco nigricans, caule a lateribus compresso, superne foliigero ibique dimidio inferiore elato, sursum angustiore; foliis brevipetiolatis, ovato-lanceolatis, breviter acuminatis, vix usque ad 4·5 cm. long., amento

gracili superne coarctato 4·0 cm. long. pedicello tenui 0·5 cm. long. insidente. Amento unico sejuncto, utrum terminale fuisset, necne, nescio. Reliqua tacite prætermitto.

Hab. Crevit in arboris trunco ad Santa Cruz mens. Sept. (N. 346.)

LAURACEÆ.

CINNAMOMUM ZEYLANICUM, Nees, in Wall. Pl. As. Rar. ii. p. 74.

Hab. Ad Villa Maria cultum sub nom. *Canella.* [Ind. Or.]

AIOUEA (§ EUAIOUEA) PRUINOSA (sp. nov.); ramulis fulvo sericeo-tomentosis, mox glabris; foliis rigidis, glabris vel in nervis minute puberulis, ovato-lanceolatis obtusis, obsolete cuspidatis, deorsum in petiolum brevem attenuatis, penninervibus, utrinque sed præsertim subtus eminenter reticulato-nervosis, margine solemniter incrassatis; inflorescentiâ pluriflorâ, folia excedente, subtiliter pruinosâ, floribus pruinosis 0·3 cm. long.; perianthii tubo lobos genitalia includentes subæquante; andrœcii seriebus 2 exter. fertilibus, 2 inter. ad staminodia reductis; antheris filamentis subæquilongis introrsis; connectivo breviter producto obtuso; staminodiis ser. IV. nec vel brevissime stipitatis; stylo ovario subæquilongo.

Hab. Crescit in cacumine montium Serra da Chapada inter Cuyabá et Santa Anna da Chapada, ubi flores et fructus simul ostendit mens. Aug. (N. 127.)

Frutex ultrametralis. Rami subteretes, cortice bruneo, nitido, tenuiter striato obducti. Folia alternantia, raro opposita vel subopposita, 7·0–9·5 cm. long., 3·0–4·0 cm. lat., pag. sup. nitida, pag. inf. decoloria; costæ secundariæ utrovis latere 6, pleræque distantes et variis angulis costæ mediæ insertæ, ipsa sub margine plus minus perspicue anastomosantes; petioli 1·0–1·3 cm. long., facie superiore canaliculati. Inflorescentiæ, ad 10·0 cm. long., effusæ. Perianthii tubus turbinatus, haud contractus, pedicello gracili floribus duplo vel triplo longiore fultus; lobi genitaliis vix longiores, leviter impares, late ovati, obtusi. Staminum filamenta tetragona, crassa, albide piloso-pubescentia; antheræ parvæ, triangulares, connectivo ultra locellos breviter ac incurve producto. Staminodia ser. III. staminibus æquilonga, basi glandulis binis magnis, ovato-rotundatis, integris aucta, liguliformia, albide piloso-pubescentia, sursum fere glabra. Staminodia ser. IV. pusilla, triangulari-ovata, apice cuspidulata, deorsum pubescentia. Ovarium subglobosum, obsolete pruinosum, 0·1 cm. diam. Stylus 0·12 cm. long., basi parum ampliatus. Stigma capitellatum. Bacca obovoidea, 1·0 cm. long., 0·7 cm. diam., apice primo apiculata, mox obtusa, basi cupellæ parvæ 0·4 cm. diam. et 0·3 cm. alt. insidens.

A proximâ *A. goyazensi*, Benth. et Hook. f., optime discrepat signis pluribus, nempe ramulis juvenilibus tomentosis, foliorum ambitu, inflorescentiâ laxiore, floribus majoribus (fll. spec. Gardneriani n. 3424 modo 0·25 cm. long., nec 0·3 cm. ut scripsit cl. Mez), perianthii lobis genitalia subæquantibus, antheris filamentis subæquilongis, staminodiis ser. IV. toto cœlo disparibus, itaque baccæ formâ. [Goyaz.]

NECTANDRA BOMBYCINA (sp. nov.); foliis brevipetiolatis, supra sericeo-tomentellis, dein, præsertim in nervis, minute pubescentibus, subtus subferrugineo-sericeis, ovato-lanceolatis, apice caudato-acuminatis, basi acutis, nequaquam acuminatis, supra obscure, subtus eminenter reticulato-nervosis; inflorescentiis quam folia brevioribus vel folia summa subæquantibus, subanguste paniculatis, ferrugineo-tomentosis, floribus hermaphroditis, tomentellis, 1·0 cm. diam., antheris ser. I. sessilibus, serr. II. et III. filamentis brevibus, crassis, biglandulosis, omnibus apice obtusis; ovario glabro, stylo manifeste breviore.

Hab. Matto Grosso (*Leeson*, in Herb. Mus. Brit.).

Ramuli 3·0–7·0 cm. diam., subteretes, sursum compresso-angulati, ferrugineo-tomentosi. Foliorum lamina usque ad 19·0 cm. long., modica vero 12·0–14·0 cm., foll. summorum usque ad 8·0–11·0 cm. imminuta, 3·0–4·5 cm. lat., acumine nec ultra 2·0 cm. long. prædita, basi acutâ et subsubito in petiolum ferrugineo-tomentosum, supra late canaliculatum, subtus striatum, plerumque circa 1·0 cm. long. desinens; costæ secundariæ utrinque 6–8, oblique insertæ, supra impressæ, subtus eminentes et in axillis inferioribus rufo-barbellatæ. Inflorescentiæ subpaucifloræ, inferiores longi-summi brevipedunculatæ, illæ reverâ usque ad 10·0 cm. long. et folia sæpe sub-æquantes, hæ nonnunquam usque ad 2·0–3·0 cm. abbreviatæ; pedunculi 1·0–6·0 cm. long., modici 5·0 cm., pedicelli circa 0·2 cm. long. Bracteæ ovatæ, acutæ, deciduæ, 0·25–0·3 cm. long. Perianthii tubus conspicuus, apice haud constrictus; segmenta subrotundata, obtusa, sæpe inæqualia, usque ad 0·3 cm. long. et 0·25 cm. lat. Antheræ ser. I. basi angustatæ, 0·12 cm. long. et lat., extus ferrugineo-papillosus, serr. II. et III. eas ser. I. superantes, ser. III. subextrorsæ, locellis juxta basin antheræ positis. Staminodia non vidi. Ovarium subglobosum, loculus 0·06 cm. long. Stylus ovarii loculum triplo excedens, basi ampliatus. Stigma obtusum. Fructus ignotus.

Juxta *N. urophyllam*, Meissn., et *N. ambiguam*, Meissn., interponenda, ab illâ discrepat, inter alia, tomento ferrugineo, foliis ovato-lanceolatis breviter nec longe acuminatis, basi acutis nec acuminatis, inflorescentiis longioribus, floribus minoribus, antheris obtusis, antheris ser. II. biglandulosis. *N. ambigua* indumentum et folia disparia, antheras ser. I. longe triangulari-acutas et ser. II. sessiles, ovarium stylo æquilongum, etc. ostendit. [Amazonia, Guiana.]

In hunc ordinem trahenda sunt specimina duo nimis manca, quæ sunt:—

(i) Frutex altus, ramosus, ramis teretibus, rufo-tomentosis, dein pubescentibus; foliis rigidis, supra glabris et nitidis, lanceolatis acuminatis, interdum cuspidatis, basi coarctatis, 8·5–15·0 cm. long., 3·0–4·8 cm. lat., paginâ superiore arcte reticulatis, margine revoluto paullo incrassatis, petiolo 1·0–1·5 cm. long. insidentibus; inflorescentiâ pauciflorâ, plerumque foliis breviore nec ultra 7·0 cm. non raro brevissimâ et modo 1–2-florâ; baccis ellipsoideis, 1·0 cm. long., 0·6 cm. diam., apice obtusis, basi cupellæ bene evolutæ, 0·6 cm. diam., deorsum in pedicellum brevem incrassatum desinente insidentibus.

Hab. Inveni ad Santa Cruz pedicellos rubros et baccas primo virides, deinde nigras mens. Nov. gerentem. (N. 518.)

(ii) Arbuscula, caule gracili erecto, ramis patulis subteretibus; foliis rigidis, ovato-lanceolatis, breviter cuspidatis, obtusis, minute reticulato-nervosis, margine revoluto paullo incrassatis, plerisque 9·0–13·0 cm. long.; petiolis 0·5–1·0 cm. long.; inflorescentiâ paucifiorâ, plerumque foliis breviore; baccis ovoideis, 1·1 cm. long., 0·7 cm. lat., viridibus, basi cupellâ evolutâ 0·7 cm. lat. et 0·35 cm. alt., deorsum in pedicellum brevem quodammodo incrassatum subito coarctatâ suffultis.

Hab. Crescit ad Santa Cruz, fructus ostendens mens. Nov. (N. 695.)

MONIMIACEÆ.

SIPARUNA GUIANENSIS, Aubl. Pl. Guian. ii. p. 865.

Hab. Viget in sylvestribus ad Santa Cruz, mens. Sept. florens. (N. 309.) [Amer. Trop.]

LORANTHACEÆ.

PSITTACANTHUS CORDATUS, Blume, in Schult. Syst. Veg. vii. p. 1730.

Hab. Reperi crescentem super *Triplaris* speciem (N. 1020 *a*) inter Villa Maria et Corumbá, itaque juxta Corumbá super *Psidium Guayava*, Raddi, et *Myrtaceam* indeterminatam, floribus et fructibus orbam, necnon super *Bauhiniam microphyllam*, Vog., prope montem Pão d'Assucar. Floret menss. Dec.–Feb. (Nn. 978, 1011, 1020, 1089.) [Bras. Or., Amazonia, Guiana, Paraguaria.]

PHTHIRUSA (§ EUPHTHIRUSA) ABDITA (sp. nov.). Scandens, radicellis prehensilibus paucis, ramulis cinereis, juvenilibus dilute bruneis; foliis lanceolatis, rarius obovato-oblongis acutis, obtusis, vel cuspidato-acuminatis, basi sensim acutatis, tenuiter coriaceis, utrinque surdis, ternationibus pedicellatis, racemosis, rarius simpliciter paniculatis, ramis axillaribus solitariis; pedicellis 0·3–0·5 cm. long.; filamentis fll. femineorum obsolete glandulosis; antheris graciliter caudato-acuminatis.

Hab. Crescit ad Santa Cruz super *Helicterem guazumæfoliam*, H. B. K., itaque in eodem loco super *Malphighiaceam* ignotam floribus et fructibus carentem. Mens. Nov. flores et baccas profert. (Nn. 594, 594 *a*.)

Planta feminea solummodo nota. Radicelli prehensiles satis incrassati, brunei, lenticellis parvis copiose muniti. Rami elongati, graciles, teretes, in longitudinem striatuli, crebre lenticelliferi, nodis tumidis; ramuli nonnunquam basi plus minus tumentes; internodia pleraque 2·0–6·0 cm. long. Foliorum laminæ 4·0–8·0 cm. long., plerumque 1·5–2·5 cm. lat., in petiolos subteretes plus minus teretes 0·7–1·3 cm. long. gradatim attenuatæ, siccæ fuscæ, vivæ dilute virides; costa media lata inferne duplicata; costæ secundariæ paucæ, una cum venulis utrinque, plus minus eminentibus, laxe reticulatæ. Inflorescentiæ erecto-ascendentes vel horizontales vel paullo decurvæ, folia subæquantes vel iis longiores, usque ad 8·0 cm. long., fere rectæ, interdum basi simpliciter paniculatæ; rhachis angulata, vix 0·1 cm. diam., superne, intervallis plerumque 0·3–0·8 cm., ternationum paria plerumque 6–8 (vel inferne rhachidem ternationiferam secundi ordinis) emittens; ternationes validius-

cule pedicellatæ, nonnunquam rhachidi alternatim affixæ. Bracteæ triangulari-ovatæ, bractea primaria secundariis acutis paullo major et obtusa, 0·12 cm. long. Flores lutescenti-virides. Calyx 0·05 cm. long., ore obscure undulato. Alabastra oblonga, obtusa, calyce et ovario incluso 0·45 cm. long. Petala 6, linearia, 0·3 cm. long. Staminodia juxta medium petalum inserta, majora vix 0·1 cm. long., filamentis sublyratis; antheræ parvæ, caudato-acuminatæ. Ovarium cylindricum, 0·1 cm. long.; stylus crassiusculus, superne amplificatus, ovarium duplo superans. Baccæ ambitu oblongæ, primâ ætate virides, dein rubræ, 0·8 cm. long., 0·5 cm. diam. Semen vix 0·6 cm. long. et 0·35 cm. lat., totum viscino cinctum. Endospermium grumosum. Radicula clavata, haud exserta. Plumula ultra cotyledones breviter exserta.

Species verisimiliter cum *Phthirusâ theloneurâ*, Eichl., conferenda; ab eâ vero differt, præter signa alia, foliis nodulis verruciformibus carentibus, inflorescentiâ interdum paniculatâ, antheris longius acuminatis, baccis majoribus. [Amazonia.]

PHTHIRUSA (§ EUPHTHIRUSA) BAUHINIÆ (sp. nov.). Scandens, radicellis prehensilibus paucis, ramulis bruneo-rufescentibus, demum cinereis; foliis brevipetiolatis, ovato-lanceolatis, mucronulatis, raro emarginatis, basi paullo coarctatis, tenuiter coriaceis, in sicco utrinque fuscis, vix nitentibus, ternationibus sessilibus vel breviter pedicellatis, paniculatis, interdum subracemosis; floribus interdum solitariis, paniculis lateralibus angustis subthyrsoideis; calycis membranacei margine obsolete undulato, filamentis fil. masculorum sursum glandulosis.

Hab. Crescit ad Santa Cruz, super *Bauhiniam cumanensem*, H. B. K., et plantam ignotam, verisimiliter *Vochysiaceam* quandam. Floret mens. Dec. (Nn. 749, 749 *a*.)

Planta feminea ignota. Radicelli prehensiles ut in *Phth. abditâ*. Rami elongati, teretes, longitrorsum striati, lenticellis parvis muniti, ad nodos parum tumidi; internodia pleraque 1·5–5·5 cm. long. Foliorum laminæ 3·5–5·5 cm. long., pleræque 1·5–2·5 cm. lat., petiolis 0·2–0·5 cm. long. canaliculatis; costa media ultra medium folii duplicata; costæ secundariæ paucæ utrinque eminentes. Paniculæ erectæ, laterales ad 6·0 cm. long.; rhachis complanata, subalata, 0·1–0·2 cm. lat. intervallis plerumque 0·8–1·0 cm. ternationes vel rhachillas ternationiferas emittens; rhachillæ uti rhachides subalatæ, erecto-ascendentes, nunc abbreviatæ, nunc usque 2·5–3·0 cm. long. Ternationum pedicelli nec ultra 0·15 cm. long. Bractea primaria triangulari-lanceolata, acuta, plana, 0·7 cm. long.; bracteæ laterales paullo minores, naviculares. Flores virescentes. Alabastra ovoidea, obtusa. Calyx tubularis, 0·1 cm. long. Petala 6, lanceolata, 0·25 cm. long. Stamina juxta basin petalorum inserta, iis breviora; filamenta incrassata, longiora superne parum ampliata, lateribus excavatis, breviora integra. Antheræ staminum longiorum reniformes, filamento fere æquilatæ, breviter caudato-acuminatæ, locellis posticis oblongis, anticis obsoletis; eæ staminum breviorum longius acuminatæ, rotundatæ, acuminatæ, locellis anticis posticis minoribus. Ovarii rudimentum parum corrugatum. Discus obsoletus. Stylus cylindricus, prope apicem parum incrassatus et curvatus. Stigmatis rudimentum obtusum, haud capitatum.

Phthirusæ Theobromæ, Eichl., foliis disparibus, paniculis multo amplioribus, floribus semper ternatim dispositis, majoribus albis nec virescentibus, staminibus aliis, et stylo recto nec curvato et stigmatis rudimento capitato gaudet. [Bras. Or., Amazonia, Guiana, Venezuela, Peruvia, Amer. Centr., Jamaica.]

STRUTHANTHUS POLYANTHUS, Mart. in Flora, 1830, p. 105. Var. MATTOGROSSENSIS (var. nov.). Abhorret a typo internodiis brevioribus, foliis plerumque paullo latioribus, calyce et ovarii rudimento majoribus, antheris longioribus et longius acuminatis, filamentis brevioribus, stylo graciliore superne angustato.

Hab. Reperi ad Jangada super *Viticem cymosum*, Bertero, et alias plantas scandentem, et mens. Sept. flores virides ostendentem. (N. 279.) [Bras. Or., Goyaz.]

ORYCTANTHUS RUFICAULIS, Eichl. in Mart. Fl. Bras. v. 2, p. 90.

Hab. Viget ad Santa Cruz super *Bauhiniam obtusatam*, Vog., et plantam indeterminatam, forsan *Vochysiaceam*. (Nn. 307, 444 *a*, 560 *a*.) [Amazonia, Guiana, Venezuela.]

PHORADENDRON RUBRUM, Griseb. Fl. Brit. W. Ind. p. 314.

Hab. Crescit ad Corumbá, verisimiliter super *Acaciæ* speciem floribus et fructibus carentem. Ibi baccas aurantiacas ostendit mens. Jan. (N. 954.) [Amer. Trop. et Subtrop.]

PHORADENDRON CRASSIFOLIUM, Eichl. in Mart. Fl. Bras. v. 2, p. 125.

Hab. Legi ad Serra da Chapada super hospitem prætermissum, necnon ad Santa Cruz super *Curatellam americanam*, Linn., et *Bauhiniam obtusatam*, Vog., crescentem. (Nn. 165, 534, 534 *a*.) [Bras. Or., Amazonia, Guiana, Venezuela, Ind. Occ.]

PHORADENDRI sp. indeterminabilis, *P. coriaceo*, Mart., affinis, ramulis nunc teretiusculis, nunc ancipitibus, et ad extremitates complanatis; vaginâ cataphyllari, plerumque solitariâ, basilari, sæpe breviter 2–3-lobâ; foliis planis lanceolato-oblongis obtusissimis, basi in petiolum brevem alatum desinentibus; laminis plerisque 7·5–9·0 cm. long., circa 3·5 cm. lat., coriaceis, opacis, rugoso-undulatis, 7-palmatinervibus; spicis binis axillaribus usque ad 3·7 cm. longis, vix 0·25 cm. diam., nondum adultis, 5–6-articulatis; prophyllis vaginis bractealibus ore 0·25 cm. diam. obsolete bidentatis articulis gracilibus 2×(11–5) floris, flore impari apicali ♀.

Hab. Reperi super *Psittacanthum cordatum*, Blume, crescentem ad Uacurisal, inter Villa Maria et Corumbá. (N. 1019.) [Bras. Or.]

EUPHORBIACEÆ.

EUPHORBIA CÆCORUM, Mart. ex Boiss. in DC. Prod. xv. 2, p. 31.

Hab. Reperi ad Santa Cruz, necnon in angustiis ad Serra da Chapada. (Nn. 70, 758.) [Bras. Or., Goyaz, Bolivia.]

EUPHORBIA BRASILIENSIS, Lam. Encyc. ii. p. 423.

Hab. Crescit ad Jangada mens. Sept. fl. (N. 257.) [Amer. Austr. Trop., Ind. Occ., Ins. Madeira.]

EUPHORBIA PILULIFERA, Linn. Sp. Pl. ed. I. p. 454. Var. PROCUMBENS, Boiss.

Hab. Florebat ad Jangada mens. Sept. (N. 255.) [Late diffusa.]

PHYLLANTHUS SELLOWIANUS ?, Muell. Arg. in Linnæa, xxxii. p. 37. (An sp. diversa ?)

Hab. Juxta fl. Paraguay, inter Santa Cruz et Diamantino, mens. Oct. (N. 641.)

Frutex circa trimetralis, copiose ramosus. Flores virescenti-albidi. Flores feminei soli suppetebant.

PHYLLANTHUS SCHOMBURGKIANUS, Muell. Arg. in Linnæa, xxxii. p. 37. Var. GUYANENSIS.

Hab. Viget ad Santa Cruz, mens. Dec. florens. (N. 744.) [Bras. Or., Goyaz, Guiana, Amazonia.]

PHYLLANTHUS NOBILIS, Muell. Arg. in DC. Prod. xv. 2, p. 414.

Hab. Floret prope Corumbá menss. Dec.–Jan. (Nn. 901, 1025.) [Amer. Austr. Trop.]

JATROPHA CURCAS, Linn. Sp. Pl. ed. I. p. 1006.

Hab. Ad Santa Cruz mens. Nov. florescit. (N. 666.) In tropicis sæpe culta.]

This plant seems to be truly wild at Santa Cruz.

JATROPHA VITIFOLIA, Mill. Gard. Dict. ed. VIII. n. 5.

Hab. Circum Cuyabá abundat, itaque in cacumine montium Serra da Chapada, ubi florentem et fructificantem reperi mens. Aug. (necnon occurrit ad Corumbá). (N. 125.)

Planta erecta usque trimetralis, ramulorum apicibus foliatis, ceteroquin aphylla. Flores albi. [Bras. Or., Goyaz, Paraguaria.]

CROTON (§ EUCROTON, EUTROPIA) MIMETICUS (sp. nov.); petiolis laminâ multo brevioribus, laminis anguste obovato-oblongis obtusis vel emarginatis, trinervibus, subtus subdense, supra rarius lepidotis, basi biglandulosis; stipulis parvis, triangulari-subulatis; racemis folio subæquilongis florum fasciculis instructis; bracteis parvis lanceolatis; florum masculorum petalis oblongo-spathulatis, intus albido-barbatis, staminibus 17, filamentis breviter pilosis, antheris oblongis; florum femineorum calycis laciniis lineari-oblongis obtusis; ovario dense lepidoto; stylis fere ad medium dichotomis, laciniis bipartitis.

Hab. Crescit ad Villa Maria, ubi mens. Dec. inveni florentem. (N. 843.)

Frutex altus, biorgyalis, copiose ramosus. Ramuli satis incrassati, subteretes 0·6–0·7 cm. diam., lepidibus dilute bruneis, margine erosulis, medio piliferis densissime obtecti; ramuli ultimi angulati, subtus in sicco compressiusculi; internodia pleraque 1·0–3·0 cm. long. Petioli ascendentes vel patuli, 2·0–3·5 cm. long., canaliculati, sub limbo incrassati, dense lepidoti; glandulæ sellæformes, 0·75 cm. diam.; lamina 10·0–20·0 cm. long., 4·0–7·0 cm. lat., basi breviter cuneatim coarctata, coriaceo-

membranacea, margine repanda, paginâ inferiore decolor ibique lepidibus lutescenti-albidis piliferis haud tangentibus munita, paginâ superiore lepides parvas raro piliferas ferens; costa media crassa, supra impressa, subtus eminens; costæ secundariæ utroque latere 12–15, subrectæ, patulæ. Racemi crassi, circa 14·0 cm. long., intervallis brevibus florum fasciculos proferentes, 0·2–0·35 cm. diam. Bracteæ 0·15 cm. long., intus fuscæ. Flores sessiles vel subsessiles. Florum masculorum sepala 0·2 cm. long., vix 0·1 cm. lat. Antheræ vix 0·1 cm. long. Florum femineorum calyx 0·5 cm. long. Ovarium 0·4 cm. long. Stylorum laciniæ involutæ, in sicco atratæ. Capsula cylindrica, vix 1·0 cm. long. Semina 0·7 cm. long. dorso longitrorsum costulata, testâ purpureo-fusco-bruneâ obducta.

Crotoni cuneato, Klotzsch, arcte affinis, distans vero ob habitum robustiorem, folia nunquam acuminata, inflorescentiam crassiorem, et præsertim flores utriusque sexûs multo majores. Stamina stirpis nostræ etiam 17 et antheræ abbreviatæ. [Amazonia, Guiana.]

CROTON (§ EUCROTON, EUTROPIA) SARCOPETALOIDES (sp. nov.). Fruticulus erectus, ramosus, indumento stellato instructus, ramulis foliosis striatis, arcte tomentoso-pubescentibus, dein puberulis; petiolis laminâ plerumque 2–3-plo brevioribus; laminâ majusculâ, late ovatâ, cuspidato-acuminatâ, basi cordatâ vel rotundato-truncatâ, ibique glandulis duabus parvis munitâ, supra glabrâ, subtus pubescente, 3-nervi; racemis demum folia longe excedentibus, validis, plurifloris, intervallis brevibus inferne solummodo flores femineos vel florum masculorum et femineorum intermixtorum fasciculos proferentibus, superne masculis; bracteis parvis, subulatis, acutis, superioribus 1–3-floris; floris masculi sepalis oblongis acutis; petalis oblongis obtusis, imâ basi barbatulis; staminibus 16, filamentis basi glabris, receptaculo piloso; floris feminei calycis laciniis erectis, triangularibus, acutis, ovario depresse globoso, dense fulvo-tomentoso, brevioribus; glandulis petalinis ut in *C. sarcopetalo*, Muell. Arg.; stylis ascendentibus, alte bipartitis, cruribus simplicibus.

Hab. Crescit ad Corumbá, mens. Jan. florens. (N. 940.)

Fruticulus nec ultra-metralis. Ramuli crebri, petioli, 2·5–3·0 cm. diam., herbacei, longitrorsum striati. Laminæ maxime inæquales, pleræque 8·0–12·0 cm. long. (4·0–17·0 cm.), 5·5–10·5 cm. lat., nonnunquam margine denticulatæ, membranaceæ, supra saturate virides, subtus pallidæ; costæ secundariæ utroque latere 5–8, interjectis passim minoribus, angulis latis insertæ, juxta marginem arcuatæ, facie inferiore eminentiores; glandulæ in sicco bruneæ vel atratæ, patelliformes, 0·12 cm. diam.; petioli usque ad 7·0 cm. long., modici vero 3·5 cm., rarissime 14·0 cm. attingentes, validi, patuli, tomentoso-pubescentes, 0·1–0·3 cm. diam. Racemi tandem usque ad 33·0 cm. long., angulati, tomentosi, deinde puberuli, basi usque ad 0·25 cm. diam. Flores masculi 0·5 cm. diam., sepalis 0·3 cm. long. Petala totidem, ungue brevi barbato exempto obsolete ciliolata. Filamenta petalis æquilonga; antheræ 0·7 cm. long., oblongæ. Florum femineorum sepala 0·13 cm. long. Glandulæ petalinæ breviter pedicellatæ, exsertæ, sellæformes, 0·07 cm. diam. Ovarium floris aperientis circa 0·2 cm. long., dense fulvo-tomentosum, mox cinereum. Stylorum crura inferne tomentosa, superne glabra involuta fusca, 0·2 cm. long. Capsula depresse

subglobosa, 0·5 cm. long. et diam., pubescens. Semina oblonga, postice parum attenuata, 0·4 cm. long., 0·3 cm. lat., testâ bruneo-purpureâ utrinque bis transversim corrugatâ.

Certe *Crotoni sarcopetalo*, Muell. Arg., proxime affinis, speciei ab auctore laudato juxta *C. soratensem*, Muell. Arg., e subsectione *Cleodorâ* (cujus bracteæ inferiores haud bisexuales) intercalatæ. Stirpis nostræ racemi characteres nunc subsectionis *Cleodoræ*, nunc florum masculorum abortu subsectionis *Eutropiæ* præbent, bracteæ infimæ vero *C. sarcopetali* semper unisexuales. Præter inflorescentiam *C. sarcopetaloides* rite secernendus videtur ob indumentum longe dispar, stamina nec ultra 16, et signa alia levioris momenti. [Argentina, Paraguaria.]

Croton (§ Eucroton, Eutropia) Sanctæ-crucis (sp. nov.); caule erecto, aphyllo, sursum ramulos foliigeros appresse tomentosos, deinde fere glabros emittente; petiolo quam lamina circa 4-plo breviore; laminâ lanceolatâ acuminatâ, basi acutatâ, ibique glandulis duabus sessilibus conspicuis instructâ, subpenninervi, firme membranaceâ, supra glabratâ, subtus albide vel subfulve vel cinereo-tomentosâ; racemis primo folia subæquantibus, mox, floribus fere omnibus jam apertis, ea paullo excedentibus, erectis, gracillimis, angulatis, tomentosis, inferne flores femineos sessiles vel flores femineos masculis intermixtos, superne flores masculos pedicellatos proferentibus; bracteis minutis, superioribus 1–3-floris, floribus brevipedicellatis; petalis masc. anguste lineari-spathulatis, ungue dense barbatis, ceterum glabris; staminibus 12; filamentis imâ basi levissime pilosis; antheris ellipsoideis, receptaculo piloso; calycis fem. laciniis triangulari-oblongis, obtusis, basi pilosis, ibique squamulâ parvâ auctis; glandulis petalinis setaceis, calycis laciniis æquilongis; ovario trigono-subgloboso, minute tomentoso; stylis glabriusculis, a basi divergentibus, ultra medium semel dichotomis, cruribus longe involutis.

Hab. Crescit ad Santa Cruz, ubi mens. Nov. floret et fructificat. (N. 567.)

Fruticulus erectus, tenuis, usque bimetralis. Caulis aphyllus, ramulos foliigeros superne emittens, cinereus, glaber, longitrorsum striatulus et rimosus, usque ad 0·35 cm. diam. Ramuli erecti, ascendentes, obsolete angulati, 0·1–1·2 cm. diam., tomento cinereo vel subfulvo instructi. Foliorum lamina plerumque 5·0–9·0 cm. long., et 1·2–2·5 cm. lat., supra sordide viridis, subtus decolor; costæ secundariæ 8–10, oblique (raro angulis latis) insertæ, leviter arcuatæ, una cum costâ medianâ supra impressæ, subtus eminentes; glandulæ patelliformes, 0·1 cm. diam., in sicco bruneæ; petioli 0·5–2·0 cm. long., ascendentes vel patuli, tomentosi. Racemi solemniter mox 6·0–9·0 cm. long., nec ultra 0·1 cm. diam. Florum fasciculi inferiores plerumque distantes, superiores approximati. Bracteæ subulatæ, pedicellos subæquantes; pedicelli tomentosi, 0·1 cm. long. Calycis masc. laciniæ oblongæ, obtusæ, 0·13 cm. long. Petala 0·22 cm. long., margine minutissime crenellata. Stamina petalis æquilonga; antheræ 0·05 cm. long. Calycis fem. laciniæ 0·12 cm. long. Ovarium 0·7 cm. long., 0·5 cm. lat., stylis in toto ipso paullo longioribus coronatum; stylorum crura 0·1 cm. long. Capsula trigono-ellipsoidea, 0·5 cm. long., 0·4 cm. lat., tomen-

tella. Semina ambitu elliptica, 0·45 cm. long., 0·35 lat., pallida, sub lente minutissime scrobiculata.

Forsan juxta *Crotonem brasiliensem*, Muell. Arg., difficiliter digerendus, sed plurimis signis ab illo discrepat. Habitu equidem ad species plures subsectionis *Cleodoræ* propius accedit; ob bracteas inferiores vero sæpe bisexuales ad subsectionem *Eutropiam* melius, me judice, referri debet. [Bras. Or.]

CROTON CAJUCARA, Benth. in Hook. Kew Journ. Bot. vi. (1854) p. 376.

Hab. Crescit in ripâ fl. Paraguay inter Santa Cruz et Diamantino, ubi floret et fructificat mens. Oct. (N. 613.) [Amazonia.]

CROTON (§ EUCROTON, CLEODORA) NIVIFER (sp. nov.); ramulis, foliis, et inflorescentiâ lepidibus minutis niveis, parcis, depresso-stellatis munitis; novellis dense tomentoso-lepidotis; foliis parvis, brevipetiolatis, lanceolatis vel lineari-lanceolatis, acutis vel breviter acuminatis, margine serrulatis, trinervibus, basi biglandulosis; racemis tenuibus, distantifloris, quam folia brevioribus, deorsum femineis; bracteis parvis triangulari-subulatis, masculis 1-3-floris; petalis masculis oblongo-spathulatis obtusis, ungue barbatis; glandulis hypogynis aurantiacis, liberis; staminibus 16, filamentis elongatis glabris; antheris ellipticis, $\frac{1}{2}$-plo longioribus quam latis; florum femineorum calycis laciniis triangularibus acutis, basi intus pilosulis; petalis glandulosis, albis; ovario quam calyx duplo longiore, lepidoto-tomentoso; stylis subbrevibus, laciniis bipartitis.

Hab. Crescit ad Corumbá et mens. Jan. floret. (N. 1096.)

Fruticulus humilis, erectus, ramosus. Ramuli subteretes, deinde glabri, striati, virescentes, lineis bruneis notati. Folia demum glabra, usque ad 5·0 cm. long., 0·8–2·0 cm. lat., nonnunquam inferne undulata nec serrulata, membranacea; costæ secundariæ 6–9, pæne rectæ, angulis valde imparibus insertæ; glandulæ patelliformes, 0·05 cm. diam., in sicco atratæ; petioli 0·5–0·8 cm. long., tomentosi. Racemi usque ad 10·0 cm. long., 0·05–0·075 cm. diam., curvati, subglabri. Bracteæ 0·075 cm. long. Flores breviter pedicellati; masculorum glabrorum calyx 0·3 cm. diam., laciniæ oblongo-ovatæ, 0·1 cm. long. Glandulæ hypogynæ conspicue subgloboso-reniformes. Filamenta 0·2 cm. et antheræ 0·03 cm. long. Calyx fem. 0·16 cm. long. et diam.; laciniæ 0·1 cm. long., erectæ, margine ciliolatæ, dorso carinulatæ. Glandulæ petalinæ globulosæ, parvæ. Ovarium trigonum, 0·35 cm. long. Styli a basi divergentes, facie interiore canaliculati. Capsula haud visa.

Forsan juxta *C. leptobotryum*, Muell., Arg., intercalandus, multis signis vero ab illo recedens. [Bras. Or.]

CROTON (§ EUCROTON, CLEODORA) DOCTORIS (sp. nov.); ramulis juvenilibus et inflorescentiæ axibus dilute lutescenti-tomentosis, illis mox subglabris; petiolis laminâ saltem triplo brevioribus; laminâ e basi obtusâ, parum obliquâ, ovatâ acutâ vel acuminatâ, mucronulatâ, subtrinervi, basi glandulis duabus parvis breviter stipitatis instructâ; racemis quam folia multoties longioribus, erectis, angulatis, multifloris,

fere dimidio inferiore femineis; bracteis minutis, triangularibus, masculis 1–3-floris; petalis masculis spathulatis, ungue dense villoso-ciliato; staminibus 17, filamentis glabris, antheris ½-plo longioribus quam latis; calycis feminei laciniis linearibus, obtusis, erectis, ovario depresso-globoso paullo longioribus; stylis fere usque ad basin bipartitis, cruribus brevibus.

Hab. Ad Corumbá satis abundat, et mens. Jan. floret. (N. 951.)

Fruticulus erectus, ramosus, usque metralis. Ramuli erecto-ascendentes, graciles, cito cortice glabro leucophæo lenticellis elevatis, plerumque secus lineolas longitudinales dispositis, instructo. Foliorum lamina usque ad 10·5 cm. long., modica vero circa 7·0 cm. long., 2·0–4·0 cm. lat., parum inæquilatera, membranacea, supra fere glabra et saturate viridis, subtus pallidior et pubescens, dein puberula; costæ secundariæ utrovis latere plerumque 8–12, nunc opposite, nunc subopposite, nunc alternatim insertæ, superiores approximatæ, levissime arcuatæ; glandulæ nec ultra 0·03 cm. diam., patelliformes, in sicco bruneæ; petioli 0·7–2·5 cm. long. Racemi plerique 14·0–21·0 cm. long., 0·1–0·2 cm. diam. Flores subdistantes, feminei plures, sessiles, latâ basi inserti, masculi pedicellis tenuibus tomentosis 0·1–0·2 cm. long. insidentes. Fl. masc. 0·4 cm. diam. albi calycis laciniæ 0·12 cm. long., apice paullo incrassatæ. Petala 0·2 cm. long., 0·1 cm. lat., obtusissima, basi longe barbato-ciliata, alibi obsolete ciliolata. Filamenta 0·2 cm. long., una cum antheris 0·5 cm. long., saltem in sicco rubescentia. Fl. fem. calycis laciniæ 0·12 cm. long., intus basi pilosæ. Glandulæ petalinæ depresso-globosæ, albæ. Ovarium hirtum, 0·2 cm. diam. Stylorum crura incurva, 0·2 cm. long., atro-purpurea. Capsulam non vidi.

Juxta *Crotonem tarapotensem*, Muell. Arg., et *C. sarcopetalum*, Muell. Arg., interponenda, ab illo abhorrens, præter alia, foliorum ambitu et magnitudine et indumento, et spicis longioribus distantifloris, ab hoc indumento foliorum omnino dispari, spicis elongatis distantifloris, fll. fem. glandulis petalinis exiguis, etc. *C. tucumanensis*, Griseb., foliis late ovatis et floribus multo majoribus gaudet. [Peruvia, Bolivia, Paraguaria, Argentina.]

Croton (§ Eucroton, Cleodora) corumbensis (sp. nov.); ramulis teretibus, gracilibus, sursum foliatis, primâ ætate albido-tomentosis, mox glabris; petiolis laminâ multoties brevioribus, albido-tomentosis, laminis ovato-lanceolatis, rarius ovatis acutis vel acuminatis, mucronatis, subtrinervibus, basi glandulis duabus parvis auctis, membranaceis, supra glabratis, subtus incano-pubescentibus; racemis folia deinde excedentibus, plurifloris, inferne flores femineos plerumque 5–9 subsessiles, superne masculos pedicellis tomentosis usque ad 0·15 cm. long. insidentes proferentibus; bracteis subulatis acuminatis florum masculorum plerumque 2–3-floris minutis, fl. masc. calycis laciniis imparibus triangulari-ovatis acutis, petalis spathulatis, acutiusculis, ungue dense barbato-ciliato; staminibus 16, filamentis glabris; glandulis hypogynis, parvis, oblongis, albis; fl. fem. calycis laciniis ascendentibus, lineari-lanceolatis, obtuse acutis, basi intus hirtulis, glandulis petalinis parvis; ovario ovoideo, quam calyx paullo breviore; stylis ascendentibus, fere ad basin bipartitis, cruribus tenuibus elongatis.

Hab. Reperi ad Corumbá, ubi mens. Jan. floret. (N. 975.)

Fruticulus erectus, altitudine prætermissâ. Ramuli 0·2–0·25 cm. diam., cortice irregulariter striato, parce lenticellifero, bruneo cinereove obducti. Foliorum lamina usque ad 9·0 cm. long. (modica 6·0 cm.), 2·0–vix 4·0 cm. lat., supra saturate viridis, subtus incana, margine ciliolata; costæ secundariæ utrovis latere 5–12, ipsa sub margine arcuatæ, venulæ obscuræ; glandulæ stipitatæ, crateriformes, 0·025 cm. diam., in sicco plerumque atratæ; petioli 0·5–1·3 cm. long., tomentosi. Racemi tempore fructificandi usque ad 12·0 cm. elongati in ingressu temporis florendi modo 2·0–4·0 cm. long. Bracteæ florum fem. infimorum nonnunquam foliis subsimiles, nisi multoties minores; superiorum et florum masc. circa 0·1 cm. long. Flores masc. albi, 0·35 cm. diam., sepala 0·2 cm. long., latiora vix 0·2 cm., angustiora modo 0·1 cm. lat. Petala 0·3 cm. long., ungue barbato exempto minute ciliolata; glandulæ hypogynæ parvæ, albæ, ambitu rectangulares. Filamenta 0·2 cm. long., antheras oblongas vix triplo excedentia. Florum fem. calycis laciniæ 0·2 cm. long. Ovarium 0·15 cm. diam., hirtum. Stylorum crura pilosa, 0·4 cm. long., in sicco brunea. Capsula cylindrica, 0·5 cm. long., hirtula. Semina (an matura ?) oblonga, postice angustata, compressa, 0·4 cm. long.

Crotoni Doctoris proximus, sed ob folia minora, racemos breviores, petala acutiuscula, fl. masc. sepala inæqualia, ovarium diversiforme, et styli crura longiora verisimiliter ut species propria rite intuendus.

CROTON (§ EUCROTON, CLEODORA) TURNERÆFOLIUS (sp. nov.). Fruticulus parvus, erectus, ramulis teretibus, validis, dense fulvo-tomentosis; petiolis laminâ multo brevioribus, laminis oblongis vel oblongo-oblanceolatis obtusis vel obtusissimis, supra mox puberulis, subtus arcte tomentoso-pubescentibus, basi glandulis duabus minutis instructis, 3-nervibus, pergamenis; racemis, plerumque folia excedentibus, erectis, plurifloris, intervallis, præsertim superne, perbrevibus florigeris, inferne flores femineos circa 10–12, superne flores solummodo masculos sustinentibus; bracteis lanceolatis, superioribus plerumque 2-3-floris, floribus utriusque sexûs breviter pedicellatis; petalis masculis oblongis obtusis, ungue brevissimo toto villoso; staminibus 13, filamentis basi villosis; sepalis femineis triangulari-oblongis obtusis, ovario hirtulo-tomentoso depresse trigono-globoso æquilongis; stylis a basi divergentibus ad medium semel dichotomis, cruribus apice involutis.

Hab. Crescit ad Santa Cruz, ubi mens. Nov. simul floret et fructificat. (N. 575.)

Caulis semimetralis, crebre foliatus, prorsus tomentosus, 0·3–0·4 cm. diam. Foliorum laminæ inæquales et reverâ majores et minores sæpe intermixtæ, juxta marginem cito pubescentes, alibi, costâ mediâ exemptâ, puberulæ, in sicco supra bruneæ, subtus subincanæ; costa media crassa, pag. inf. eminens; costæ secundariæ utrovis latere 5–10 oblique insertæ, prope marginem arcuatim anastomosantes, ceterum rectæ vel fere rectæ; venulæ obscuræ; petioli circa 1·0 cm. long., patuli, pingues, dense tomentosi. Racemi 7·0–12·0 cm. long., basi usque ad 0·3–0·4 cm. diam., plane angulatæ et aliquanto complanatæ. Bracteæ, pleræque circa 0·2 cm. long., extus tomentosæ. Pedicelli 0·1–0·2 cm. long. Flores dilute viridi-lutescentes. Sepala mascula triangulari-oblonga, obtusa, 0·2 cm. long. Petala totidem, ungue excluso, glabra.

Filamenta 0·35 cm. long.; antheræ late ellipticæ. Sepala feminea 0·2 cm. long., intus pilosula. Glandulæ petalinæ parvæ, ovoideæ, dense pilosæ, albæ. Ovarium 0·2 cm. diam. Styli atrati, pilosi, 0·2 cm. long., cruribus gracilibus, 0·22 cm. long., glabris. Capsula oblongo-ellipsoidea, 0·6 cm. long., 0·5 cm. diam., arcte pubescens. Semina oblonga, 0·4 cm. long., pæne 0·3 cm. lat.; testa griseo-brunea, lævis.

Non dubito quin ad *Crotonem peraffinem*, Muell. Arg., spectet, sed indumento molliore, foliis obtusis longius petiolatis, floribus 13-andris, filamentis basi villosis, capsulâ oblongo-ellipsoideâ nec globoso-ellipsoideâ, necnon seminibus longioribus ac latioribus certe non conspecifica. [Bras. Or., Goyaz.]

CROTON ANTISYPHILITICUS, Mart. in Isis, 1824, p. 586.

Var. caulibus 23·0 cm. alt., simplicibus, superne piloso-hirsutis foliis lineari-lanceolatis vel lanceolatis, 3·0–4·5 cm. long., 0·7 cm. lat., superne dentato-serratis scabride stellato-pubescentibus, margine in sinibus dentium glandulosis.

Hab. In cacumine montium Serra da Chapada flores virides præbet mens. Aug. (N. 180.) [Bras. Or.]

CROTON (§ EUCROTON, CLEODORA) PACHECENSIS (sp. nov.). Fruticulus parvus, ascendens, a basi vel tantummodo superne ramosus, indumento lepidoto-stellato-tomentoso albido arctissime obtectus; foliis brevipetiolatis, lanceolato-linearibus, mucronulato-acutatis, subtriplinervibus, basi subrotundatis, glandulosis; racemis abbreviatis, paucifloris, basi femineis, superne masculis, floribus omnibus (præsertim femineis) pedicellatis; bracteis exiguis, ovatis, obtusis, superioribus 1–2-floris; florum masc., albido-tomentosorum petalis linearibus, obtusis, prorsus (præsertim vero basi et apice) barbato-ciliatis; staminibus 11, filamentis glabris; sepalis femineis linearibus acutiusculis, ovarium breviter excedentibus, basi intus squamulâ parvâ auctis; ovario trigono-subgloboso, lepidoto-tomentoso; stylis a basi divergentibus ultra medium semel dichotomis, cruribus, una cum stylis pilosis, sursum arcuatim incurvis.

Hab. Ad Puerto Pacheco floret et fructificat mens. Feb. (Nn. 1050, 1062.)

Planta gracilis circa 35·0 cm. alt. Radix attenuatus, radicellos fibrosos subsimplices parum undulatos plagiotropicos emittens. Caulis deinde minute lepidotus, longitrorsum striatulus, purpureo-leucophæus, 0·2 cm. diam., imâ basi ad 0·35–0·4 cm. incrassatus. Rami 2–3–4-chotome divisi. Ramuli gracillimi, teretes. Petioli 0·3–0·8 cm. long. Laminæ pleræque 1·5–2·5 cm. long., solemniter 0·35–0·7 cm. lat., firme membranaceæ, supra pallide virides, minute pubescentes, subtus albide lepidoto-tomentosæ, costæ secundariæ obscuræ. Racemi nec ultra 2·5 cm. long., plerique vero breviores, graciles, lepidoto-tomentosi. Bracteæ 0·04 cm. long. Pedicelli florum masc. vix 0·2 cm., florum fem. fere 0·2 cm. long., sub fructu usque ad 0·3 cm. long. Sepala mascula petalis æquilonga, ovata, obtusa. Petala 0·2 cm. long. Filamenta petalis paullo breviora; antheræ latitudine et longitudine æquali. Sepala feminea 0·15 cm. long., erecta; glandulæ petalinæ obsoletæ vel ad setam parvam reductæ. Ovarium 0·12 cm. diam. Styli 0·07 cm. long. cruribus 0·1 cm. long., pallidis. Capsula ovoidea, arctissime lepidoto-tomentosa, vix 0·5 cm. long.

Semina parva, oblonga, complanata, utrinque brevissime costulata, sub lente minute scrobiculata, pallida, 0·3 cm. long.

Crotoni angustifronti, Muell. Arg., speciei mihi descriptione solummodo cognitæ, evidenter arcte affinis, ab eo abhorrens, præter alia, indumento albido nec ferrugineo, foliis longius petiolatis, minoribus, nunquam linearibus, bracteis masculis 1–2-floris, floribus 11-andris, sepalis haud acuminatis. [Bras. Or.]

CROTON (§ ASTRÆA) COMANTHUS (sp. nov.); caulibus erectis, gracilibus, mox puberulis; petiolis elongatis, tenuibus, folia excedentibus vel subæquantibus, vel quam ea paullo brevioribus; laminâ tripartitâ, segmentis lanceolatis vel ovato-lanceolatis acuminatis, lateralibus divergentibus, omnibus serrulatis, supra pilosis, subtus pubescentibus, tenuiter membranaceis; stipulis conspicuis, setaceis; racemis elongatis, gracilibus, folia excedentibus, pluri- et distantifloris; bracteis subulato-setaceis, quam pedicelli masculi tenuissimi circa 2-plo brevioribus; floribus omnibus pedicellatis; florum masc. glabrorum petalis spathulato-oblongis obtusis, dimidio inferiore margine barbato-ciliatis, ceterum glabris; staminibus circa 16, filamentis brevibus; antheris transverse ellipticis, sc. latioribus quam longis; sepalis femineis oblongis obtusis, ovarium paullo excedentibus; ovario cylindrico; stylis paullo ultra medium 6-fidis.

Hab. Reperi inter Santa Cruz et Villa et Maria mens. Dec. florentem et fructificantem. (N. 1022.)

Caulis 0·2–0·3 cm. diam., sursum ramosus. Ramuli erecto-ascendentes, in sicco brunei, primâ ætate tomentosi, cito puberuli, teretes, longitrorsum striati, lenticellis minutis instructi. Petioli usque ad 8·0 cm., modici circa 4·0 cm. long., mox piloso-puberuli. Laminæ 4·0–9·0 cm. long., basi late subcordatæ vel truncatæ, 3·0–5·0 cm. lat., supra in sicco rubescentes, subtus subincanæ, usque ad $\frac{4}{5}$ vel altius trilobæ, segmentum medium quam lateralia longius et latius, usque 7·5 cm. long., modica circa 5·0 cm. lat.; costæ secundariæ utrinque circiter 6, sæpe subopposite insertæ, leviter arcuatæ. Glandulæ subobsoletæ. Stipulæ usque ad 0·6 cm. long., tenuissimæ, basi ampliores, erectæ, piloso-puberulæ. Racemi fere ad 30·0 cm. long. (modici circa 22·0 cm.), deorsum nudi, mox puberuli, angulati, nec ultra 0·1 cm. diam. Flores masculi pedicellis 0·2 cm. long. fulti. Flores feminei intervallis plerumque 1·0–1·5 cm. orti, rarius congesti; pedicelli validi, minute albido-tomentosi, circa 0·25 cm. long., bracteas pilosulas duplo excedentes. Sepala mascula ovata, obtusa, petalis æquilonga. Petala et filamenta 0·17 cm. long. Sepala feminea 0·23 cm. long., intus pilosula, margine hirtulo-ciliata. Glandulæ petalinæ ambitu rectangulares, in sicco nigricantes. Ovarium 0·15 cm. diam., hirtulo-tomentosum. Styli ascendenti-divergentes, pilosi, 0·2 cm. long., uterque cruribus 6 tenuibus, involutis, bruneo-purpureis, 0·35 cm. long. instructi. Capsula 0·6 cm. long., glabra, membranaceo-crustacea, pallida. Semina oblonga, tetragona, postice truncata, vix 0·5 cm. long., 0·3 cm. lat., utrinque leviter corrugata, pallida, purpureo-bruneo-maculata.

Species juxta *C. Gardneri*, Muell. Arg., intercalanda, abs quâ foliis parvis longi-

petiolatis, floribus masc. 16-andris, floribus fem. evolutis minoribus, sepalis fem. brevioribus, stylis nec profunde 6-fidis, ex meâ sententiâ rite secernenda. [Bras. Or.]

CROTON CHAMÆDRIFOLIUS, Griseb. Fl. Brit. W. Ind. p. 41.

Hab. Crescit in ripâ fl. Paraguay inter Santa Cruz et Villa Maria, ubi mens. Dec. floret et fructificat. (N. 826.) [Amazonia, Guiana, Venezuela, Nov. Granat., Ins. Trinitatis.]

CROTON, sp. incertæ sedis. Fruticulus circa 30·0 cm. alt., caule sat crasso, erecto, superne parce ramoso; ramulis albido-lepidoto-tomentosis; petiolis quam folia multoties brevioribus 0·5–0·8 cm. long., patulis vel decurvis, lepidoto-tomentosis; laminis ovato-lanceolatis acuminatis, vix usque ad 0·6 cm. long. (modicis 4·5 cm.), firme membranaceis, superne mox fere glabris, virescentibus, subtus minute lepidoto-tomentosis, basi glandulis duabus patelliformibus, atratis, 0·04 cm. diam. instructis; racemis quam folia brevioribus, paucifloris; floribus masculis, solummodo cognitis, subsessilibus; bracteis exiguis, setaceis, 1–2-floris; sepalis ovatis obtusis; petalis oblanceolatis, inferne barbatis, ceterum fere glabris; staminibus 11, filamentis glabris; antheris ellipticis, receptaculo piloso.

Hab. Ad Santa Cruz florescit mens. Nov. (N. 688 *a.*) *Curraleira* vicanorum.

True *Curraleira* is *Croton antisyphiliticus*, Mart. Like that plant, the present is held in repute as a remedy for venereal disease.

HETEROCROTON, Euphorbiacearum, e tribu Crotonearum, genus novum.

Calyx masc. 5–6-partitus, laciniis ovatis, æstivatione apice tantum imbricatis; lacinia impar postice, scilicet axin inflorescentiæ spectans. Petala 5–6, evoluta, æstivatione imbricata. Glandulæ disci, cum petalis alternantes, parvæ. Receptaculum glabrum. Stamina centralia 10–11, filamenta florum nondum apertorum inflexa. Antheræ subbasifixæ, biloculares, connectivus dorso incrassatus. Calycis fem. laciniæ 6–8, unâ serie insertæ, æquales vel subæquales, nec 5 majores cum 5 minores alternantes, marginibus plus minus pectinatæ, rigidæ, incrassatæ, basi squamâ parvâ auctæ. Petalorum rudimenta cum calycis laciniis alternantia, oblonga vel linearia, setifera. Ovarii loculi 2 ?, uterque loculus 1-ovulatus. Styli 3, dichotome divisi. Fructus et semina desiderantur.

Fruticulus parvus, hirsutus. Folia subquinquenervia, alterna, petiolata, plane stipulata; fol. superiorum lamina basi biglandulosa vel abortu uniglandulosa, inferiorum eglandulosa. Racemi terminales basi flores femineos paucos (circa 2) sursum, intervallo interjecto, flores masculos subsessiles dense confertos proferentes. Bracteæ conspicuæ, persistentes. Calyx fem. et styli pilis hispidis flavidis onusti.

Genus juxta *Crotonem* inserendum, inter *Crotonem* et *Julocrotonem* quasi medium tenens, ab ambobus vero, præsertim calyce miro, optime abhorret.

HETEROCROTON MENTIENS (sp. nov.).

Planta circa 40·0 cm. alt. Caulis e rhizomate valido, brevi, usque ad 1·0 cm. diam., parce radicigero ascendens, una cum basi ramulorum nodis leviter tumidis

subpurpurascenti-cinereus, longitrorsum striatulus, lenticellis eminentibus copiose munitus. Ramuli sursum foliati ibique strigose fulvo-hirsuti, 0·1–0·25 cm. diam. Foliorum lamina ovato-oblonga, obtusa vel obtusiuscula, basin versus sensim angustata, nonnunquam leviter truncata, plus minus impariter lobulata vel serrato-crenata, utrinque hirsuta, firme membranacea; costæ secundariæ paucæ, inconspicuæ, oblique insertæ, primo fere rectæ juxta marginem subito et magnopere arcuatæ; glandulæ patelliformes, breviter stipitatæ, 0·1 cm. diam., saltem in sicco bruneæ; petioli valde inæquales et reverâ 0·3–1·7 cm. long., fol. inf. graciles, fol. sup. validi, fol. omnium ascendentes, fulvo-hirsuti. Stipulæ setaceæ, circa 0·5 cm. long., hirsutæ. Racemi post anthesin ultra 4·0 cm. long., maturius (fil. fem. apertis, masc. nondum expansis) circa 2·5 cm. long. Racemi hirsuti. Flores feminei circa 2 (an unquam flos solitarius?), intervallo 1·0 cm. long. inter eos et flores masculos interposito. Bracteæ lanceolatæ, acutæ, hirsutæ, arcuatæ, usque ad 0·3 cm. long. Florum masc. brevissime pedicellatorum sepala hirsuta, 0·18 cm. long., una cum petalis crebre glanduloso-punctata. Petala anguste obovato-oblonga, obtusissima, juxta basin longe barbata, alibi margine barbatula, saltem floris vix aperientis sepalis æquilonga. Filamenta glabra, floris nondum aperti petalis breviora; antheræ ellipticæ, 0·06 cm. long., 0·04 cm. lat. Pollinis grana patelliformia, ambitu sphærica vel subsphærica, tuberculata, lineâ triradiatâ aucta. Calycis fem. laciniæ oblongæ, acutæ, intus atro-bruneæ et sursum hirtellæ, deorsum glabræ, 0·25–0·3 cm. long., lacinulæ suæ dimidium partis rhachialis raro excedentes; squamæ subquadratæ, albæ, circa 0·03 cm. long. et lat. Petalorum rudimenta rigida, integra vel leviter lobulata, dorso setis elongatis munita, usque ad 0·12 cm. long. Ovarium 0·1 cm. diam., pilosum. Styli a basi distincti, divergenti-ascendentes, longe infra medium dichotomi, 0·2 cm. long.; crura involuta, fere ad medium dichotoma vel indivisa.

Hab. Schedulâ amissâ, planta incertæ habitationis, sed verisimiliter ad Santa Cruz crescit.

My specimen of this interesting plant is unfortunately unique, so that material for ascertaining facts of structure is not available. The most noteworthy point is doubtless the calyx of the female flower. The small section *Decalobium* of *Croton* contains two species, *C. sincorensis*, Muell. Arg., from Bahia, and *C. decalobium*, Muell. Arg., a Central American plant; these have an unequally 10-partite calyx with entire laciniæ; the quinary symmetry is therefore not departed from. *Julocroton* has pectinate calyx-laciniæ, like those of our plant, but the upper (posticous) laciniæ are greatly reduced in size (rudimentary in fact), and the lower one is larger than its lateral fellows. *Heterocroton* unites the actinomorphic calyx of *Croton* with the pectinate laciniæ of *Julocroton*, and differs from both in the absence of quinary symmetry.

The specimen has only one ovary, which, after being opened, has been carefully secured in a capsule, so as to be available for future examination. I feel very undecided about the placentation, as all I could with certainty make out was a couple of ovules lying immersed in a magma. Whether we have here something resembling the

placentation of *Crotonopsis*– and I should not be surprised if this were the case—can be determined only when more material comes to hand.

Through water getting into the 'Explorer' I lost about ten per cent. of my Santa Cruz plants, and I suspect that specimens of *Heterocroton* must have been among them.

I have omitted a diagram of the female flower, as the nature of the ovary is so uncertain. The specific name is an expression of the homoplasy between the plant and *Croton antisyphiliticus*, Mart., and, to judge from the figure, *C. Tamberlikii*, Muell. Arg.

JULOCROTON ELÆAGNOIDES (sp. nov.); ramulis subteretibus, arcte lepidotis; petiolis limbo brevioribus, raro æquilongis vel longioribus; laminis ovatis obtusis, basi truncato-rotundatis, nonnunquam levissime cordatis, margine undulatis, 5-nervibus, lepidotis, subtus incanis; stipulis elongatis, parvis, laceratis vel integris; bracteis setaceis, pedicellos excedentibus; petalis masc. lacinias calycis æquantibus, lineari-spathulatis, dorso-pubescentibus, præsertim basi et apice barbato-villosis, glandulis hypogynis 3 anticis oblongis, truncatis, 2 posticis quam anticæ paullo minoribus; staminibus 11, filamentis dimidio inferiore longe barbatis, ceteroquin pubescentibus; antheris ellipticis, dimidio longioribus quam latis; calycis fem. laciniis 3 anticis late lineari-oblongis obtusis, 2 posticis setaceis, brevibus; ovario trigono-subgloboso; stylis erectis, basi coalitis, brevibus, hirto-tomentosis, bis dichotomis, cruribus mediocribus involutis.

Hab. Juxta Corumbá florebat et fructificabat mens. Jan. (N. 911.)

Fruticulus diffusus, metralis. Ramuli erecto-ascendentes, striatuli, cinerei, lepidibus minutis stellato-piligeris arcte obtecti, aliquanto torti, 0·2–0·4 cm. diam. Foliorum lamina usque ad 11·5 cm., modica 5·0–6·0 cm. long., 2·0–8·0 cm. lat. (modica 2·5–3·0 cm.), pergamena, lepidibus parvis piligeris facie laminæ inferiore argenteis, sæpe in nervis primariis pag. sup. luteolis, dense obtecta; costæ secundariæ paucæ, oppositæ vel alternatim insertæ, leviter arcuatæ, supra obscuræ, subtus eminentes; petioli plerique 0·5–2·0 cm. long., raro 7·0–7·5 cm. attingentes, ascendentes, rigidi, albide stellato-lepidoti; stipulæ circa 0·5 cm. long., setaceæ, acuminatæ, nunc indivisæ, nunc semel vel bis lacerato-dentatæ. Spicæ post anthesin usque ad 2·5 cm. long., tempore florendi nec ultra 1·0 cm. long. Bracteæ circa 0·5 cm. long. Calycis masc. laciniæ anticæ argenteo-lepidotæ, oblongæ, obtusæ, 0·17 cm. long.; posticæ ovatæ, membranaceæ. Petala sepalis æquilonga et filamenta (saltem floris vix aperientis) excedentia. Antheræ 0·1 cm. long. Calycis fem. laciniæ margine breviter denticulatæ, tomentosæ, intus basi castaneæ, 0·3 cm. long., 0·15 cm. lat.; laciniæ posticæ altius connatæ, intus fere glabræ. Disci lobi antici ovati, acuminati, 0·07 cm. long., postici obsoleti. Stylorum rigidorum pars indivisa vix 0·1 cm. long., cruribus inclusis circa 0·2 cm. long. Capsula tomentosa, trigono-subglobosa, 0·4 cm. long. et lat. Semina 0·3 cm. long. et lat., subplumbea, nitida.

Non dubito quin ad *J. Gardneri*, Muell. Arg., accedat, indumento vero gaudet diverso, petiolis brevioribus, stipulis sæpe haud integris, fl. masc. glandulis hypogynis et calycis fem.

laciniis disparibus, etc. A *J. stipulari*, Muell. Arg., cujus stipulæ haud indivisæ, discernitur, inter alia, calycis fem. laciniis omnino disparibus. [Bras. Or.]

JULOCROTON LEPIDUS, (sp. nov.); ramulis gracilibus, ascendentibus, angulatis, arcte lepidoto-tomentellis, dein glabris; laminis ovato-oblongis vel ovato-lanceolatis, basi rotundatis, 5-nervibus, pergamenis, præsertim subtus arcte argenteo lepidoto-tomentosis, quam petioli longioribus; stipulis elongatis, setaceis, indivisis, rarius lacinulatis; bracteis setaceis, pedicellos breves excedentibus; petalis masc. spathulato-oblongis obtusis, præsertim basi barbato-ciliatis; glandulis hypogynis minutis; staminibus 11, 3–4 vero nonnunquam ad staminodia reductis; filamentis pilosis; antheris ellipticis, 2-plo longioribus quam latis; calycis fem. laciniis anticis tomentosis, ovatis vel ovato-rotundatis, obtusissimis, margine (apice excluso) breviter lacinulatis, lacinulis dimidium partis rhachialis nequaquam æquantibus, laciniis posticis minutis; ovario trigono-globoso, tomentoso; stylis tomentosis. erectis, basi coalitis, bis dichotomis, cruribus brevibus involutis.

Hab. Reperi ad Puerto Pacheco, ubi floret et fructificat mens. Feb. (N. 1057.)

Ramuli ad 0·2 cm. diam., longitrorsum striatuli, primo cinerei, dein dilute brunei. Foliorum lamina usque ad 5·0 cm. long., vix 3·0 cm. lat., obtusa vel acuta, supra pallide virescens; costæ secundariæ paucæ, leviter arcuatæ, supra impressæ, subtus eminentes; petioli 0·4–2·0 cm. long., ascendentes vel patuli, arcte albido-tomentosi. Stipulæ 0·4 cm. long. Spicæ abbreviatæ usque ad 1·5 cm. long. Bracteæ usque ad 0·4 cm. long., pleræque circa 0·2 cm. Calycis masc. laciniæ anticæ extus argenteo-lepidotæ, triangulari-oblongæ, obtusæ, 0·12 cm. long.; laciniæ posticæ ovato-oblongæ, membranaceæ. Petala 0·12 cm. et antheræ 0·075 cm. long. Calycis fem. laciniæ anticæ tomentosæ, floris aperientis 0·3 cm. long., 0·25 cm. lat., dorso concavæ, lacinulis dimidio partis rhachialis 4-plo brevioribus, nihilominus planis; laciniæ posticæ altius connatæ, deltoideæ, leviter lacinulatæ. Disci lobi antici ovati, obtusi, circa 0·1 cm. long.; postici obsoleti. Stylorum pars indivisa 0·1 cm. long., cruribus (ultimis brevibus) inclusis 0·2 cm. long. Capsula globosa, minute pubescens, 0·4 cm. long. Semina 0·3 cm. long., 0·22 cm. lat., brunea, levia, haud nitida.

Præcedenti affinis, distinctus vero præsertim characteribus floralibus, ex gratiâ floribus masculis minoribus, petalis suis disparibus et antheris brevioribus, calycis fem. laciniis anticis diversiformibus et semper plane lacinulatis, laciniis posticis deltoideis nec setaceis, glandulis hypogynis majoribus, styli tomentosi cruribus ultimis abbreviatis, necnon seminibus insigniter minoribus et bruneis, haud plumbeis. [Bras. Or.]

JULOCROTON MONTEVIDENSIS, Klotzsch, ex Baill. Ét. Euphorb. p. 376, var. *calycis fem. laciniis dentatis.*

Hab. Crescit in ripâ fl. Paraguay inter Santa Cruz et Villa Maria, mens. Dec. florens. (N. 839.) [Bras. Or., Paraguaria, Uruguaria.]

Fruticulus metralis, erectus, sursum tantummodo foliatus.

After spending much time upon this plant I have decided to name it as above.

Julocroton abutiloides (sp. nov.); caulibus, ramulis, foliis, et floribus dense et breviter lanato-tomentosis; ramulis teretibus, ascendentibus vel patulis; petiolis quam folia brevioribus, raro ea subæquantibus, foliorum summorum fere obsoletis; laminis late ovatis, rarius ovato-lanceolatis, acutis vel obtusis, basi leviter cordatis, margine denticulatis, trinervibus; stipulis elongatis, setaceis; spicis quam folia brevioribus; inflorescentiâ ambitu ovatâ, densiflorâ; bracteis stipulis similibus; petalis masc. anguste linearibus, obtusis, barbato-ciliatis; staminibus 11, filamentis basi barbatis, ceteroquin pilosulis; antheris oblongis, 3-plo longioribus quam latis; calycis fem. laciniis anticis late ovatis acutis, margine subbreviter lacinuligeris, laciniis posticis perbrevibus utrinque tomentosis; disci lobis anticis spathulatis, superne dense tomentosis, alibi pilosis; ovario trigono-subgloboso, tomentoso, stylis erectis, basi coalitis, tomentosis, bis dichotomis, cruribus ultimis subbrevibus apice breviter involutis.

Hab. Crescit ad Corumbá, ubi mens. Jan. flores et fructus profert. (N. 968.)

Fruticulus $\frac{2}{3}$-metralis, erectus, copiose ramosus. Caulis circa 0·3–0·5 cm. diam., obsolete angulatus. Folia plerumque 5·0–9·0 cm. long., 2·5–6·5 cm. lat., supra pallide viridia, subtus incana, sæpe basi parum obliqua; costæ secundariæ paucæ, levissime arcuatæ, sæpissime oblique insertæ; raro angulo fere recto; petioli vix usque ad 5·5 cm. long., modici circa 2·5 cm., foliorum summorum non ultra 0·5 cm. long., validi, dense albo-tomentosi; stipulæ vix usque ad 1·0 cm. long., scariosæ. Spicæ 2·0–3·5 cm. long., subcompressæ. Calycis masc. laciniæ ovatæ, acutæ, 0·24 cm. long., posticæ anticis paullo latiores et membranaceæ. Petala masc. 2·2 cm. long. Filamenta petalis æquilonga; antheræ 0·1 cm. long., 0·03 cm. lat. Calycis laciniæ fem. anticæ 0·4 cm. long. et lat., laterales margine libero, basi longiuscule lacinulatæ, alibi solummodo breviter denticulato-incisæ; laciniæ posticæ alte connatæ, setaceæ. Disci lobi antici 0·2 cm. long., 0·075 cm. lat. Ovarium pæne 0·5 cm. long. et lat. Stylorum, in toto 0·45 cm. long., pars coalita 0·15 cm. et crura ultima 0·1 cm. long., hæc breviter pilosa, atrata. Capsula trigono-subglobosa, 0·55 cm. long. et lat., tomentosa. Semina 0·35 cm. long., 0·3 cm. lat., fusco-purpurea, nitida.

Species ab affinibus ita distinguenda :—

A *J. solanaceo*, Klotzsch, præter alia, foliis imparibus nec integris nec obsolete denticulatis, stipulis longioribus, spicis abbreviatis, filamentis inferne albo- nec aureo-lanatis, antheris brevioribus connectivis haud pubescentibus.

A *J. verbascifolio*, Klotzsch, indumento ramorum molli nec strigoso-rigido, foliis longius petiolatis, spicis haud fulvo-ferrugineo-tomentosis, bracteis setaceis, floribus masculis majoribus, antheris brevioribus, calycis fem. minoris laciniis anticis disparibus, itaque seminibus diversis.

A *J. humili*, Didr., staturâ elatiore, indumento dispari, foliis majoribus diversiformibus, calycis fem. laciniis neque profunde lineari-pinnatipartitis nec pinnatisectis, filamentis barbatis, antheris brevioribus, seminum funiculo parvo. [Bras. Or.]

Julocroton humilis, Didr. in Kjœb. Vidensk. Meddel. (1857) p. 132.

Hab. Ad Jangada mens. Sept. floret. (N. 284.) [Bras. Or.]

ARGITHAMNIA (§ ATHORA) PURPURASCENS (sp. nov.); foliis brevipetiolatis, trinervibus, fere usque ad basin minute serrulatis; floribus monoicis; calycis masc. laciniis lanceolatis, acuminatis; petalis masc. quam calycis laciniæ paullo brevioribus, breviter unguiculatis, ovato-lanceolatis, breviter acuminatis, dorso obsolete puberulis; calycis fem. laciniis lanceolatis, acuminatis; petalis femineis minutissimis, subulato-setaceis; glandulis ovato-rotundatis, quam calycis laminæ multoties brevioribus; ovario albide hirto-villosulo, capsulis appresse villosulis; seminibus pyriformi-globosis, reticulato-insculptis.

Hab. Viget ad Corumbá, mens. Jan. florens et fructificans. (N. 959.)

Fruticulus circa semimetralis. Caulis subteres, purpureo-cinereus, albo-punctatus, longitrorsum striatulus, 0·3–0·4 cm. diam. Ramuli graciles, patuli, subangulati, purpurei, cito appresse pilosi. Folia lanceolata, utrinque acutata, membranacea, utrâvis facie appresse pilosa, usque ad 7·5 cm. long. (modica 5·0 cm.), 1·5–2·0 cm. lat., pleraque viridi-purpurea; petioli circa 0·3 cm. long., hirtelli; costæ secundariæ perpaucæ, erecto-ascendentes, fere rectæ. Stipulæ setaceæ, 0·25–0·3 cm. long. Inflorescentiæ axis appresse hirtellus, 0·5–0·8 cm. long. Bracteæ lanceolatæ, hirtellæ, usque ad 0·2 cm. long. Pedicelli calyce breviores, sub fructu 0·2 cm. long., appresse hirtelli. Flores virides. Calycis masc. hirtelli laciniæ vix 0·4 cm. long. Petala basi cum columnâ connata 0·15 cm. long. Glandulæ hypogynæ parvæ, ovatæ, obtusæ, basi petalis atque columnæ stamineæ breviter adnatæ, 0·03 cm. long. Stamina complete biverticillata, sc. verticillus superior 5-antheriferus. Calycis fem. hirtelli laciniæ 0·6 cm. long.; ejus petala integerrima vix 0·1 cm. long.; glandulæ membraniformes, 0·5 cm. long., margine undulatæ. Ovarium trigono-globosum, 0·15 cm. long. et lat. Stylus in toto 0·45 cm. long., appresse pilosus, purpurascens, plerumque bis dichotomus; crura ultima brevia, integra vel breviter bifida. Capsula subglobosa, 0·35 cm. diam. Semina vix 0·3 cm. long. et 0·2 cm. lat., dilute brunea, rhaphide atratâ notatâ.

Ab *A. montevidensi,* Muell. Arg., optime abhorret, ex gratiâ, foliis majoribus fere ad basin serrulatis, glandulis fll. masc. basi solummodo columnæ staminali adnatis, petalis fll. fem. setiformibus, et glandulis brevibus nec calycem fere æquantibus et filamenta simulantibus, itaque stylis longioribus. [Bras. Or., Paraguaria, Uruguaria.]

MANIHOT TRIPARTITA, Muell. Arg., in DC. Prod. xv. 2, p. 1068. Var. VESTITA (var. nov.); caule dilute lutescente, lanato-tomentello, foliolis ad 9·5 cm. long., florum partibus dense vestitis, bracteolis bracteas excedentes.

Hab. Incolit locos apertos in cacumine montium Serra da Chapada, mens. Aug. florens et fructificans. (N . 186.) Bras. Or., Goyaz.]

ACALYPHA SUBVILLOSA, Muell. Arg., in Mart. Fl. Bras. xi. 2, p. 341.

Hab. Reperi ad Jangada, mens. Sept. florentem. (N. 272.)

Frutex scandens trimetralis et ultra. Ramuli tantum sursum foliigeri. [Bras. Or., Goyaz, Venezuela.]

ACALYPHA BREVIPES, Muell. Arg., in Linnæa, xxxiv. p. 24.

Hab. Crescit ad Jangada, mens. Sept. florens. (N. 275.)

Fruticulus ⅔-metralis. Caulis erectus, gracilis, apice tantummodo foliatus. [Bras. Or.]

ACALYPHA (§ EUACALYPHA) AMPHIGYNE (sp. nov.); petiolis limbo brevioribus, ascendentibus vel patulis, limbo subquinquenervi, membranaceo, supra mox, costis pubescentibus exemptis, puberulis, subtus pubescentibus; stipulis setaceis, acuminatis; spicis androgynis axillaribus, basi vel juxta basin bracteam unicam femineam sursum flores masculos dense confertos et apice solemniter florem fem. pedicellatum fructiferum vel abortu sterilem proferentibus; bracteis fem. 1-floris, rotundatis, 11-laciniatis, laciniis anguste lineari-lanceolatis vel linearibus obtusis, proximalibus 1–2 utrinque nonnunquam abbreviatis; floribus masc. hirtellis; calycis fem. laciniis 3 oblongo-ovatis; ovario hirtello; stylis latere ventrali a lacinulis circa 10 iis ipsis longioribus coronatis.

Hab. Crescit juxta Corumbá, ubi mens. Dec. floret. (N. 1024.)

Suffrutex ⅔-metralis, erectus, ramosus. Ramuli graciles, subteretes, striatuli, breviter pubescenti-tomentosi, dein glabri. Foliorum laminæ modicæ 4·0–10·0 cm. long., raro usque ad 2·0 cm. imminutæ, 2·5–5·5 cm. lat., ovato-lanceolatæ vel ovatæ, breviter acuminatæ, basi rotundatæ, solemniter levissime cordatæ, margine serratæ vel (interdum subgrosse) crenatæ; costæ secundariæ 7–9, levissime arcuatæ, utrinque eminentes et pubescenti-tomentellæ; petioli 0·5–2·5 cm. long., subpatuli, minute tomentoso-pubescentes. Stipulæ pleræque 0·3–0·4 cm. long., angustissimæ, dorso hirtellæ. Spicæ usque ad 6·0 cm. long., graciles, pars mascula non ultra 0·2–0·3 cm. diam., pubescenti-tomentellæ. Flores masc. aperientes 0·04 cm. diam. Bracteæ fem. hirtellæ, 0·4 cm. lat., 0·23 cm. long.; lacinulæ usque ad 0·13 cm. long., apice paullo incrassatæ. Capsula ignota.

Species singularis, et cum nullâ mihi notâ componenda nisi cum *A. apicali*, N. E. Br., abs quâ differt foliis latioribus breviter petiolatis, stipulis longioribus, bracteis femineis majoribus et 11-lacinulatis (nec 7-lacinulatis), floribus femineis solitariis nec in parte inferiore spicæ pluribus, itaque stylis disparibus. [Paraguaria.]

ACALYPHA COMMUNIS, Muell. Arg., in Linnæa, xxxiv. p. 23. Var. *intermedia*, Muell. Arg.

Hab. Mens. Dec. floret ad Santa Cruz. (N. 745.) [Bras. Or., Goyaz, Uruguaria, Paraguaria.]

ALCHORNEA CASTANÆFOLIA, Ad. Juss. Tent. Euph. p. 42.

Hab. Vulgatissima in margine fll. Paraguay, San Lorenzo, Cuyabá, etc. Nec flores nec fructus vidi. [Bras. Or., Goyaz, Amazonia, Venezuela.]

DALECHAMPIA (§ EUDALECHAMPIA) SYLVESTRIS (sp. nov.); petiolis foliola subæquantibus; stipulis subfalciformi-lanceolato-subulatis acuminatis; involucri foliolis majusculis, late quadrato-ovatis, trifidis, membranaceis; calycis fem. laciniis 6, sub

flore lanceolatis acutis, sub fructu leviter ampliatis, imâ basi utrinque 1-lacinulatis, lacinulis nunc 0·05 cm. long., barbellatis vel pæne effetis; ovario minute tomentoso, columnâ stylari ovarium multoties superante crassiusculâ, inferne breviter tomentellâ, dimidio superiore leviter incrassatâ et glabrâ, apice levissime ampliatâ; seminibus globosis, levibus.

Hab. Viget in sylvâ primævâ inter Santa Cruz et Tapirapuan, mens. Sept. flores et fructus simul proferens. (N. 376.)

Ramuli gracillimi, scandentes, breviter pubescentes vel piloso-pubescentes, leucophæi, non ultra 0·15 cm. diam., teretes. Stipulæ 0·5–0·8 cm. long., basi 0·1–0·18 cm. lat., rigidæ, patentes, pubescentes. Petioli usque ad 5·0 cm. long., modici 2·0–3·0 cm., patuli, graciles, pubescentes; foliola lanceolata, cuspidulato-acuminata, lateralia basi intus acuta, extus valde obliqua et leviter semicordata, raro usque ad 5·0 cm. long. (modica 3·0–3·5 cm.), circa 1·0–1·5 cm. lat., margine undulata, firme membranacea, supra sparsim strigoso-puberula, subtus pallidiora et brevissime pubescentia. Pedunculi petiolos sæpissime subæquantes, graciles, piloso-pubescentes, sub flore 1·0–2·5 cm. long., sub fructu usque ad 8·0 cm. Involucri foliola alba, 3·5–4·0 cm. long., nervosa, margine undulata vel serrulata, puberula, 5–6-nervia, lobi triangulari-lanceolatis, acuminatis, serrulatis, stipellis lineari-lanceolatis, puberulis, et 0·8–1·5 cm. long. Calycis fem. tomentelli laciniæ sub flore 0·22–0·25 cm. long., sub fructu duplo longiores et rigidiusculæ. Columna stylaris tempore florendi 0·8 cm. long. Capsula depressa, tridyma, brevissime tomentella, circa 0·8 cm. diam. Semina 0·4 cm. diam., brunea, atro-maculata.

Cum *Dalechampiâ subintegrâ,* Muell. Arg., multis signis arcte congruens, indumento vero, foliis minoribus longipetiolatis, involucri foliolis longioribus acuminatis, calycis laciniis tomentellis, columnâ stylari insuper breviore et dimidio inferiore tomentellâ, ex meâ sententiâ, species propria rite existimanda. [Bras. Or.]

Dalechampia (§ Eudalechampia) cynanchoides (sp. nov.); foliis breviter petiolatis, simplicibus, lanceolatis vel ovato-lanceolatis, basi cordatis, firme membranaceis; stipulis brevibus lineari-subulatis; involucri foliolis parvis, indivisis, cordato-ovatis acuminatis; bracteis fem. late rotundatis, integris, obtusissimis; calycis fem. laciniis circa 10 lanceolatis, inæqualibus, margine lacinulatis, lacinulis latitudinem laciniarum circa æquantibus vel eâ brevioribus; ovario tomentello; columnâ stylari glabrâ, superne ampliatâ; calyce paullo longiore, apice subito incrassato et excavato, ore brevissime 6-lobulato; seminibus subdepresse globosis, levibus.

Hab. Ad Santa Cruz flores et fructus gerit mens. Oct. (Nn. 483, 653.)

Ramuli volubiles, teretes, pubescentes, graciles, vix unquam ultra 0·15 cm. diam. Stipulæ pleræque 0·2 cm. long., firmæ, decurvæ. Petioli 0·4–1·0 cm. long., pubescenti-tomentelli; foliorum lamina 3·5–7·0 cm. long., 1·0–4·0 cm. lat., apice plerumque acuta, margine undulata vel undulato-serrulata, basi 5-nervis, præsertim subtus puberula, pallide nitida, venulis utrinque eminentibus laxe reticulatis. Pedunculi 0·8–2·0 cm. long., graciles, pubescentes. Involucri foliola viridia, usque ad 1·0 cm. long. et 0·8 cm. lat., basi lata, 4–5-nervia, margine leviter crenulata vel

crenulato-serrulata, puberula. Stamina circa 20; columna staminea 0·075 cm. alt. Calycis fem. hirtello-ciliati laciniæ circa 0·25 cm. long., sub fructu 0·3 cm., et ad capsulam arcte applicatæ. Columna stylaris tempore florendi circa 0·32 cm. long. Capsula depressa, tridyma, minute pubescens, 0·4 cm. diam. Semina albescentia, 0·3 cm. diam., lineis paucis longitudinalibus notata.

Speciem juxta *Dalechampiam convolvuloidem*, Muell. Arg., et *D. Leandri*, Baill., sine dubio intercalandam primo obtutu cognoscere potes ob folia brevipetiolata multo longiora quam lata et involucri foliola parva. [Bras. Or.]

Dalechampia scandens, Linn. Sp. Pl. ed. I. p. 1054.

Hab. Floret ad Santa Cruz mens. Nov. (N. 600.) [Amer. et Afr. Trop., Ind. Or.]

Dalechampia cuiabensis, Muell. Arg. in Linnæa, xxxiv. p. 222.

Hab. Crescit ad Santa Cruz, ubi menss. Oct.–Nov. floret. (Nn. 408, 571.) Involucri foliola dilute purpurascentia. [Goyaz, Bolivia.]

Mabea Indorum (sp. nov.); inflorescentiis micranthis floribundis; bracteis, in ipso axe inflorescentiæ sitis, ovatis acutis, glandulis duabus comparative magnis alveolato-rugosis instructis; pedicellis masc. tenuibus; calycis laciniis fem. 6 parvis, inæqualibus, deltoideis, obtusis, eglandulosis; staminibus 4–9; ovario tomentello, inermi; columnâ stylari stylorum, partem liberum æquante, sursum leviter trisulcatâ; capsulis immaturis subglobosis, inermibus, rufo-tomentellis.

Hab. In ripâ fl. dos Bugres reperi mens Oct. florentem. (N. 436.)

Arbor altitudine prætermissâ. Ramuli ascendentes, patuli, graciles, teretes, laxe rufulo-tomentosi, mox pilosi, dein glabri, et cortice purpurascenti-cinereo in longitudinem rimis brevibus angustissime ellipticis notato obtecti. Foliorum lamina lanceolato-oblonga, breviter cuspidato-acuminata, superiorum minor 5·0–7·0 long., inferiorum 10·0–13·0 cm., pleraque 2·5–4·5 cm. lat., basi acutata, margine serrulata vel undulato-serrulata, coriacea, supra nitida, in sicco nequaquam atrata, eximie reticulato-nervosa, subtus albescens et primo tomento fulvo sparso, mox deciduo instructa, dein glabra; costæ secundariæ 10–15, minoribus sæpe interjectis, angulis latis insertæ, rectæ vel levissime undulatæ, dein dichotome fractæ et arcuatim junctæ; petioli circa 1·0 cm. long., torti, canaliculati, mox glabri. Racemi graciles, basi eflorigeri ibique bracteas minutas perpaucas proferentes, 4·0–6·0 cm. long. (cujus pars florigera 3·0–5·0 cm.), fulvo-tomentelli; rhachis 0·07 cm. diam., pars mascula 0·4 cm. diam. Flores masculi ex axillis bractearum ternatim orti, summi vero sæpe solitarii. Bracteæ vix 0·1 cm. long.; glandulæ usque ad 0·07 cm. diam., subglobulares. Pedicelli masculi 0·4 cm. long., tenuissimi, basi levissime incrassati, tomentelli. Flores masc. evoluti 0·12 cm. diam. Stamina minute tomentella; antheræ 0·06 cm. lat. Flores fem. solitarii; pedicellus circa 0·7 cm. long., tomentellus; calycis tubus 0·15 cm. long., 0·22 cm. lat., tomentellus; laciniæ breves, circa 0·03 cm. long. Styli pars indivisa 0·5 cm. long., tomentella. Capsula immatura vix 1·0 cm. diam., rufo-tomentosa, viva quasi pruinosa. Semina nondum matura ambitu elliptica, 0·7 cm. long., 0·45 cm. lat.

A proximâ *Mabeâ paniculatâ*, Benth., abhorret imprimis foliis majoribus, diversiformibus, in sicco nequaquam striatis, floribus masc. plerumque oligandris, antheris majoribus, glandulis bractearum majoribus. *M. Pohliana*, Muell. Arg., calycis laciniis 3 et staminibus 3 vel 2 et glandulis levibus gaudet. [Amazonia.]

MABEA FISTULIFERA, Mart. Reise, i. p. 479.

Hab. Crescit in cacumine montium Serra da Chapada, ubi mens. Aug. fructificat. (N. 308.)

Arbor circa 10-metralis. [Bras. Or., Amazonia.]

MABEA CRENULATA (sp. nov.); inflorescentiis micranthis, floribundis; bracteis, ipso in axi inflorescentiæ sitis, ovato-lanceolatis acutis, glandulis duabus parvis leviter alveolatis instructis; pedicellis masc. abbreviatis, calycis fem. laciniis 6, ovatis obtusis, eglandulosis; staminibus circa 12; ovario fulvo-tomentoso inermi, capsulâ ignotâ.

Hab. Inveni ad Santa Cruz mens, Oct. florentem. (N. 423.)

Arbor circa 5-metralis. Ramuli ascendentes, teretes, longitrorsum rimosi, cinerei, primo fulvo-tomentosi, mox glabri. Folia ut in præcedente, nisi paullo minora et angustiora, apice obtusa vel acuta nec cuspidata, basi parum rotundata et margine crenulata, in sicco paginâ inferiore subrubescentia, paginâ superiore albescentia. Inflorescentia speciminum meorum imperfecta, sed plane paniculiformis, sc. e racemis (2–3 ?) basi florem unicum (?) femineum gerentibus composita. Bracteæ 0·13 cm. long., extus tomentosæ; glandulæ vix 0·05 cm. diam., ovideæ. Pedicelli masculi florum vix apertorum modo 0·1 cm. long., tomentelli. Flores masc. parvi, vix 1·0 cm. diam. Stamina tomentella; antheræ parvæ, 0·04 cm. lat. Fl. fem. pedicellus 0·6 cm. long., tomentellus; calyx 0·2 cm. long., 0·25 cm. lat., laciniæ 0·1 cm. long. Reliqua sileo.

Distat a *M. paniculatâ*, Benth., foliis diversiformibus, fl. masc. pedicello abbreviato, et calyce fem. dispari. *M. Indorum*, nob., nullo negotio cognoscenda ob inflorescentiam paniculatam, flores masc. brevipedicellatos, antheras parvas, et calycem fl. fem. diversum. [Amazonia.]

MAPROUNIA GUIANENSIS, Aubl. Pl. Guian. ii. p. 895.

Hab. Inveni ad Serra da Chapada, alt. 600 met. super mare, mens. Aug. florentem. (N. 162.) [Amer. Austr. Trop.]

SEBASTIANA SERRULATA, Muell. Arg. in DC. Prod. xv. 2, p. 1167.

Hab. Ad Santa Cruz mens. Nov. floret. (N. 580.) [Bras. Or., Goyaz.]

EUPHORBIACEÆ INDETERMINABILES.

i. *Sebastiana* ? sp. Frutex vel fruticulus, ramulis gracilibus, ascendentibus, glabris; foliis brevipetiolatis, ovato-lanceolatis, cuspidatis, obtusis, undulatis vel crenulatis, basi acutatis, membranaceis, glabris, plerisque 5·5–8·0 cm. long. et 2·5–5·0 cm. lat.; floribus femineis breviter pedicellatis; bracteis ovatis, leviter incisis; calycis trilobi,

0·15 cm. long., lobis breviter incisis; ovario subgloboso 0·2 cm. diam.; stylis brevibus; capsulâ subglobosâ, brevi, circa 1·2 cm. diam. Reliqua desunt.

Hab. Reperi in ripâ fl. Paraguay, prope Tres Barras, mens. Oct. (N. 622.)

ii. Euphorbiacea dubia, forsan *Alchorneæ* sp.?

Arbuscula $3\frac{1}{2}$–4-metralis, trunco erecto ramoso, ramulis subteretibus, cortice cinereo rimoso obductis; foliis petiolatis, ovatis vel oblongo-ovatis, obtusis vel obtusissimis, crenato-serratis basi aliquanto rotundatis, tenuiter coriaceis, subtus stellato-puberulis, et in axillis costarum secundariarum pilosis; capsulis, rhachidi ex ramis lignosis forsan anni præcedentis ortis, 9·5 cm. long., 0·15 cm. diam., tomentellis insertis, didymis vel tridymis, usque ad 1·0 cm. lat., 0·7 long., vivis viridibus, minute puberulis; seminibus ecarunculatis, transverse ellipticis, 0·5 cm. long., 0·6 cm. lat., pallidis, tuberculis parvis nigris secus lineas anticas-posticas dispositis instructis.

Hab. Ad Santa Cruz fructificat mens. Nov. (N. 557.)

CELTIDEÆ.

CELTIS GARDNERI, Planch. in Ann. Sc. Nat. Bot. 3me sér. x. p. 311.

Hab. In ripâ fl. Cuyabá haud procul ab urbe, itaque juxta Santa Cruz et viciniam. (Nn. 13, 630.) [Bras. Or.]

SPONIA MICRANTHA, Decne. ex Planch. in Ann. Sc. Nat. Bot. 3me sér. x. p. 333.

Hab. Ad Santa Cruz floret mens. Dec. (N. 770.) [Amer. Trop., Paraguaria.]

MORACEÆ.

DORSTENIA, sp. nov.? ex affinitate *D. brasiliensis*, Mart. Planta pusilla, folio oblongo, obtusissimo, margine undulato, subtus, præsertim in nervis, minute pubescente, vix 4·0 cm. long. et 2·0 cm. lat., subtus conspicue penninervi, petiolo crassiusculo pubescente 2·5 cm. long.; pedunculis, quam petioli brevioribus, pubescentibus; receptaculo suborbiculari, 0·7 cm. diam., pubescente, horizontali, margine integro. Rhizoma non vidi, et folium unicum sejunctum mihi solummodo obvium.

Hab. Vigebat ad Corumbá, mens. Jan. flores præbens. (N. 963.) [Bras. Or.]

ARTOCARPEÆ.

FICUS SUBTRIPLINERVIA, Mart. in Flora, xxiv. (1841) II. Beibl. 67.

Hab. Reperi in ripâ fl. dos Bugres, ad Santa Cruz, mens. Nov. florentem. (N. 676.) Arbor ramosa, circa 10-metralis. (Determ. G. F. Scott Elliot.) [Bras. Or., Goyaz.]

FICUS sp. indeterminabilis, sine floribus et fructibus.

Hab. Fl. Paraguay, inter Santa Cruz et Diamantino. (N. 505 *a.*)

Mr. Scott Elliot notes of this that it seems near *F. Segoviæ*, Miq., but is probably a new species of § *Pharmacosyce*.

FICUS (§ UROSTIGMA) ELLIOTIANA (sp. nov.); ramulis mox fere omnino glabris, foliis longiuscule petiolatis, ovato-cordatis, obtusissimis, coriaceis, glabratis, basi 6–9-nerviis, utrinque 9–12-costatis; stipulis firmis, conico-erectis, sericeo-tomentosis; receptaculis axillaribus vel extra-axillaribus, solitariis vel binis, sessilibus nascentibus, involucro firmo, calyptriformi, sericeo-tomentoso inclusis, subglobosis, minutissime tomentosis, basi involucro trilobo instructis, apice bracteis parvis occlusis.

Hab. Colitur ad Corumbá, ubi floret mens. Jan. (n. 1040 *a*); etiam in Paraguariâ ad Asuncion detexit cl. Balansa (n. 1985).

Arbor foliosa, circa 10-metralis. Ramuli cortice laxo, rimoso cinereo, transversim direpto cincti. Foliorum lamina 11·0–14·0 cm. long., 8·5–12·0 cm. lat., margine passim plus minus undulato, pag. sup. punctis minutis albis inspersæ; costæ secundariæ pleræque fere rectæ, juxta marginem arcuato-connexæ; costa media crassa, subtus eminens, supra impressa, venulæ arcte reticulatæ; petioli 3·5–6·0 cm. long., crassiusculi. Stipulæ 0·8–1·0 cm. long., apice paullo incurvæ vel recurvæ. Receptacula 0·7 cm. long., vix totidem diam. Flores masculi superiores, pauci, breviter pedicellati; perianthium bipartitum, segmentis obovatis, obtusis; staminis unici connectivus crassiusculus, apice breviter apiculatus; antheræ late ellipticæ. Flores feminei nunc sessiles juxta apicem receptaculi, nunc pedicellati, bracteolis linearibus vel lineari-lanceolatis, acutis, pedicellum 0·1 cm. long. subæquantibus, intermixti; perianthium 3-partitum, segmentis oblongis vel ovatis, subæqualibus, 0·1 cm. long. Ovarium subglobosum; stylus lateralis, caudatus, ovarium vix superans.

Species sine dubio ad *F. calyptroceratem*, Miq., spectans, abhorrens vero, præter indumentum tomentellum foliorum ac ramulorum, signis multis momenti gravioris ac levioris.

I refer Balansa's plant here, although it differs from mine in its broader, somewhat more fleshy and stouter-petioled leaves. Paucity of material has caused me to refrain from dissecting the receptacle of Balansa's plant, which, naturally, is exactly like that of mine, except for its somewhat more tomentose indumentum.

I much regret that my specimen of this fine tree, a row of which, yielding most grateful shade, has been planted in front of the Custom-House at Corumbá, should be a single specimen, and that in no very satisfactory condition.

Mr. Scott Elliot examined this plant for me, and indicated its affinity. [Paraguaria.]

BROSIMUM GAUDICHAUDII, Tréc. in Ann. Sc. Nat. Bot. 3me sér. viii. p. 140.

Hab. Crescit in locis apertis ad Santa Cruz passim, ubi nuncupatur *Algodão do Campo.* (N. 656.)

The fruit when ripe is yellow and the size of a small gooseberry. It is eaten by the people at Santa Cruz, but is not very palatable. [Bras. Or.]

Brosimopsis, Artocarpearum, e tribu Euartocarpearum, gen. nov. (Pl. XXXI.)

Flores dioici, omnes globoso-capitati, capitulis basi bracteis perpaucis parvis instructis. Flores ♂: Perianthium subscariosum, tubulosum, 4-partitum, segmentis æstivatione imbricatis. Stamina 4, declinata, basi ipsi perianthii segmentorum inserta; filamentis dein longiuscule exsertis, æstivatione rectis; antheræ subcylindricæ. Ovarii rudimentum 0. Flores ♀: 2–4 circa æquatorem receptaculi dispositi, eorum perianthium receptaculo. Ovarium receptaculo inclusum basique ei adnatum, sursum in stylum e receptaculo exsertum desinens; stigmata 2, elongata, crassiuscula, a basi divergentia, apice acutata; ovulum ab apice loculi pendulum, anatropum; micropyle supera. Fructus globosus vel subgloboso-didymus, exocarpio (sc. receptaculo ampliato) carnoso, endocarpio tenuiter crustaceo exocarpio deorsum concretum. Semina solitaria vel bina (et tunc fructus subgloboso-didymus), a dorso compressa, ambitu late elliptica vel suborbicularia; funiculus latus; hilum conspicuum, circulare; testa membranacea; albumen 0; cotyledones carnosæ, una alterâ duplo major; radicula supera.—Arbor lactescens. Folia ampla, breviter petiolata, indivisa, penninervia, tenuiter coriacea; stipulæ laterales, firmæ, diu persistentes. Florum receptacula in axillis plerumque solitaria, erecta vel patula, breviter pedunculata. Bracteæ exiguæ, ovatæ, receptaculo multoties breviores. Bracteolæ parvæ, peltatæ, receptaculum femineum obtegentes et floribus masculis intermixtæ. Flores masculi receptaculo hemisphærico basi brevissime immersi.

Genus singulare ob naturam fructus *Brosimum* in mentem revocat, ab eo equidem longe abhorret de receptaculo unisexuali, et floribus masculis toto cœlo disparibus, et floribus femineis æquatorialibus, nec apicalibus vel subapicalibus. Ab omnibus generibus reliquis Brosimearum—scilicet *Lanessania*, Baill., *Bosquiea*, Thou., *Scyphosyce*, Baill. —differt, præter alia, receptaculis unisexualibus, et ab *Olmedieis* receptaculis haud basi bracteis amplis ∞-serialibus cinctis. Inter *Euartocarpeas*, *Helianthostyli*, Baill., e regione Amazonicâ, videtur proxima, cujus flores masculi attamen rudimento, feminei apice stylo elongato instructo gaudent, et flores feminei solitarii. *Cudrania*, Tréc., genus gerontogæum, floribus masculis aliquanto similibus, tamen flores femineos omnino dispares ostendit, qui etiam longe diversi in *Treculiâ*, Decne., ex Afr. Trop. Itaque flores masculi *Parartocarpi*, Baill., stirpis Borneensis, perianthio carent et flores feminei perianthium contra præbent. Receptacula feminea *Batocarpi*, Karst., hucusque sola cognita, floribus dense aggregatis, perianthio instructis, necnon bracteis intermixtis obteguntur. *Moreis* ab omnibus differt primo obtutu filamentis in alabastro rectis.

Brosimopsis lactescens (sp. nov.). Arbor elata (♀) vel arbuscula (♂) foliosa, ramulis subteretibus minute pubescentibus, dein glabris, cinereis irregulariter rimosis, crebro lenticelliferis, cicatriculis ellipticis eminentibus foliorum evanidorum abundanter instructis, vulgo 0·2–0·4 cm. diam. Stipulæ erectæ, circa 0·6 cm. long., lanceolatæ, acuminatæ, dorso puberulæ, membranaceæ, longitrorsum nervosæ, decolores. Foliorum lamina oblonga vel oblongo-lanceolata, plerumque breviter cuspidata, basi leviter obliqua, obtusa, sæpe leviter rotundata, margine revoluta, obsolete undulata, minute pubescens, cito glabra, usque 17·0 cm. long. et 7·0 cm. lat.

(mediocria 12·0×5·0 cm.); costæ secundariæ circa 20, interjectis aliis minoribus, angulis latis insertæ, rectæ vel fere rectæ, rarissime mox dichotomæ, sub margine arcuatim conjunctæ, utrinque (præcipue subtus) eminentes; venulæ eminentes, arcte reticulatæ; petioli ♂ 1·0 cm. long., subteretes, minute pubescentes. Receptaculorum pedunculi 0·2 cm. long., minute pubescentes, sub fructu sæpe ad 0·5–0·6 cm. elongati. Capitula masculina 0·5–0·7 cm. diam., glabra, subcarnosa, basi bracteis circa 6 minutis, rotundatis, membranaceo-scariosis, 0·07 cm. long. instructa, viva viridia. Bracteolæ minutæ, vix 0·1 cm. long., subito peltatim dilatatæ, pars peltata 0·5 cm. diam. vel latior, minute pubescens, margine ciliolata. Perianthii segmenta late obovata, obtusissima, interdum emarginata, 0·13 cm. long., usque 0·03–0·04 cm. alt. coalita, extus minute pubescentia, margine ciliolata, intus minute pilosula. Filamenta deinde perianthium paullulum superantia; antheræ 0·07 cm. long. Receptaculum femineum basi bracteas masculinis similibus ostendens, tempore fructificandi circa 0·5 cm. diam., et nunc bracteolis exiguis, peltatis, minute pubescentibus, margine ciliolatis, magnitudine diversa, sed vix unquam 0·05 cm. diam. attingentes dense obtectum. Os pseudoperigoniale pubescens, sursum parum ampliatum. Ovarium subglobosum, apice paullo angustatum, 0·1 cm. long.; stylus vix 0·2 cm. long., vix ad 0·1 cm. receptaculo inclusus, a receptaculo omnino liber, minute pubescens; stigmata stylum subæquantia. Fructus 1·0–1·5 cm. diam., minute puberulus, bracteolis haud amplificatis præsertim juxta basin instructus. Semina 0·6–0·7 cm. long., 0·7–0·8 cm. lat., pallide brunnea vel brunneo-purpurea, plus minus transversim rugata; hilum 0·15 cm. diam., stramineum.

Hab. Ad Santa Cruz viget, et mens. Oct. floret, mens. insequente fructus ostendens. (Nn. 366 [♂] et 677 [♀].)

A general view of the stem in transverse section as seen under a low power is given in Plate XXXIX. fig. 6. The drawing represents a somewhat rare state of things, inasmuch as tracheæ and tracheïdes are very scarce, their place being taken by a large number of prosenchyme cells; but although along other radii there are usually more vascular elements, even there the proportion of prosenchyme is still high. The protoxylem often projects some distance into the pith. The phloëm is sufficiently voluminous, the hard bast being but slightly developed. There is a hard pericycle. Here and there the cortex is strengthened by sclerenchyme cells; its fourth cell-layer functions as a phellogen-layer. Material for studying the arrangement of the leaf-traces is not to hand.

The plentiful milky latex is contained in tubes, which, in the stem, are seldom, if at all, branched. These latex-tubes are frequent in the pith and the outer bast, and more rarely they are met with in the cortex. In the pith they may often be traced running for considerable distances and without septa, thus conforming with the rule relating to the latex-tubes of *Artocarpeæ*. In other cases, however, transverse partitions are clearly shown, and the tube may vary in appearance in different parts of its course. Accompanying the latex-tubes are usually short, thin-walled elements, overlying one another in longitudinal series, and filled with a substance turning red on boiling sections with caustic soda. These rows of cells may undergo much alteration in breadth within a short

distance, and may even pass over into ordinary pitted pith-cells; their contents would seem to be placed in continuity by means of fine threads passing through minute pores in the intervening septa. An extreme case of septation of a latex-tube is shown at fig. 7 of the cited plate; upon its right side are pith-cells, to the left is a row of cells with contents contracted and turned red by boiling in caustic soda, these cells passing below into ordinary pith-cells. Similar cells accompanying latex-tubes may also be seen at the outer part of the bast, and more rarely in the cortex. What may be the relation, if indeed there be any at all, between these rows of cells and the latex-tubes, I am not prepared to say.

The epiderm of the leaf's upper side (fig. 7) is either one or two cells deep; below it lies the well-marked palisade tissue and the spongy mesophyll, the latter having but few interspaces, and these very small. Only on its lower face can stomates be seen. Slender latex-tubes accompanied by cells similar to those above alluded to are found chiefly in the vascular bundles of the leaf (fig. 9 shows a tube with a septum across it); the contents of many of the leaf-cells, and their walls as well, are turned a fine brick-red after lying a little time in glycerine.

The latex-tubes can best be seen in the tissues of the embryo, and especially in the cotyledons (fig. 10). The cells of the latter organs are crammed with small starch-grains, and coursing among the cells are very numerous freely-branching non-septate latex-tubes. But one concludes at once that the latex is not confined to the tubes, since many of the cells are seen to contain latex in addition to starch. I imagine there must be some connection between these cells and the latex-tubes: indeed, the tubes can sometimes be seen to be terminated by a cell, or a group of cells; hitherto, however, I have not succeeded in satisfactorily demonstrating continuity. Other laticiferous cells may be seen in close relation with the tubes in their course (fig. 1 ♂, & fig. 10 ♀), though most of the cells lying in proximity to the tubes have no latex. Such a drawing as that shown in fig. 12 is very suggestive of connection between tube and cells, a short string of the latter clearly seeming to act as a continuation of the tube. The presence of latex in cells as well as in tubes, which latter may be simple or branched and septate or non-septate—that is, the exhaustion of all possibilities in one and the same species—is, I venture to think, a matter of some slight interest.

The latex consists for the greater part of fine granules, in which I failed to detect stratification. Seeing that dried material alone is available, it has been thought better not to attempt further study of this substance, though an opportunity of doing so may possibly occur in the future, as what few seeds could be spared have been sent to Dr. Trimen, of Peradenia Gardens, Ceylon, with a view to germination. The economic importance of a good rubber plant is a fact patent to all, and I think it not impossible that *Brosimopsis* may prove to be of some value in this relation.

The ripe seed is contained in a thin crustaceous membrane—the persistent ovarian wall. To this membrane the seed, after maturation, is found still attached close to its hilum, so that, in extracting the seed, portions of the envelope are very apt to be left behind, fixed to the edge of the prominent hilum. The testa is of a pale brown colour and is very thin.

SOROCEA GRANDIFOLIA (sp. nov.); ramulis petiolisque puberulis, illis cito glabris; foliis majusculis, breviter petiolatis, oblongis vel anguste oblongo-obovatis, abrupte cuspidato-acuminatis, grosse spinoso-dentatis, coriaceis, eximie nervosis; stipulis ovato-lanceolatis, petiolum subæquantibus; receptaculis utriusque sexûs axillaribus, solitariis vel geminis; floribus masc. brevissime pedicellatis, floribus fem. receptaculorum partitionibus erectis vel patulis, nunquam pendulis, superne incrassatis et ellipsoideis, minute hirtello-scabriusculo-pubescentibus insertis; perigonia ore angustissimo, integro, membranaceo, minute ciliolato; stigmatibus brevibus, lanceolatis obtusis, integris, recurvis; ovulo apicali.

Hab. Floret ad Santa Cruz mens. Nov. (N. 566.)

Fruticulus elatus, copiose ramosus. Ramuli teretes, cinerei, longitrorsum striati, in nodis parum tumidi. Foliorum lamina usque 26·0 cm. long., et 10·0 cm. lat., mediocria circa 14·0 cm. long. et 5·0 cm. lat., in cuspidem plerumque circa 2·0 cm. long. apice spinigeram subito desinens, basi rotundato-obtusa, margine prorsus spinoso-dentata, spinis rigidis tenuibus 0·4 cm. long., apice decoloribus; costæ secundariæ utrovis latere 12–15, interjectis aliis tertii ordinis, angulis latis insertæ, levissime arcuatæ, marginem versus dichotomæ, ramis angulo fere recto cum costâ antecedente et insequente conjunctis, inde in spinam procurrentes; venulæ arcte reticulatæ; petioli 0·5–1·5 cm. long., patuli, validi, facie superiore anguste canaliculati; stipulæ rigidæ, 0·7 cm. long., mox deciduæ. Receptacula mascula evoluta, plerumque 5·0–7·0 cm. long., hirtello-scabriusculo-pubescentia, a basi dens florigera. Flores masculi albi, dilutissime virides, 0·45 cm. diam., pedicelli sui incrassati, vix ad 0·1 cm. long. Receptacula feminea usque ad 7·0 cm. long., hirtello-scabriusculo-pubescentia, rhachis circa 0·1 cm. diam., erecto-ascendens; partitiones mox 0·7 cm. long., plerumque erecto-curvatæ, deorsum usque 0·1 cm. diam., sursum ad 0·25 cm. subito incrassatæ, pars incrassata 0·3 cm. long. Perigonii triens superior a receptaculo liber, os ejus breviter tubulosum, 0·06 cm. diam., et 0·5 cm. alt. Ovarium $\frac{1}{2}$-superum; stylus sursum gradatim attenuatus; stigmata 0·07 cm. long.; ovarii loculus mox 0·2 cm. long. Ovulum stricte apicale. Fructus desiderantur.

Species eximia et de signis insequentibus facili negotio recognita, nempe foliis maximis e basi longe spinoso-dentatis, indumento receptaculorum, floribus masculis brevissime pedicellatis, receptaculis fem. erectis, perigonii forma, ovario $\frac{1}{2}$-supero, necnon ovulo vere apicali. Forsan juxta *S. Klotzschianam*, Baill., intercalanda sit, sed plurimis punctis ab illâ abhorret. [Amazonia.]

MONOCOTYLEDONES.

ORCHIDEÆ.

CATTLEYA SUPERBA, Schomb. ex Lindl. List Orch. sub t. 22.

Hab. Crescit passim prope Santa Cruz; reperi itaque ad ripas fl. Brasinho mens. Oct. florentem. (Nn. 568, 690.)

I am indebted to Mr. R. A. Rolfe for this identification, which considerably extends the range of this beautiful plant. [Amazonia, Guiana, Venezuela, Columbia Or.]

Epidendrum imatophyllum, Lindl. Gen. et Sp. Orch. p. 106.

Hab. Inveni fl. Paraguay impendentem juxta Tres Barras mens. Oct. (N. 657.)

Mr. im Thurn notes that in Guiana *E. imatophyllum* is always associated with ants, and it is a curious coincidence that, in securing this, the only specimen which we saw, Dr. Evans was severely stung by a swarm of small yellow ants. Ants frequently take up their quarters in decaying orchid pseudobulbs, which they apparently excavate for the purpose; but inasmuch as the present species belongs to a section without pseudobulbs, the insects probably inhabit the spaces between the stem and the closely-appressed leaf-sheaths. Anyway, a few undoubted ant-holes are to be seen in the leaf-sheaths of my specimen, which, moreover, has a solid stem. [Amazonia, Guiana.]

Epidendrum variegatum, Hook. Bot. Mag. t. 3151.

Hab. Sat frequens, mens. Oct. florescens, in ripâ fl. dos Bugres. (Nn. 543, 544.) [Brazil Or., Amazonia, Guiana, N. Grenada, Peruvia.]

Ad hoc genus forsan relegandum exstat insequens:

Epidendrum (§ Amphiglottium ?), sp. ? *E.* caule folioso, stricto; foliis distichis, lanceolatis obtusis vel obtusiusculis, 8·0–18·0 cm. long., 1·7–3·3 cm. lat., coriaceis; inflorescentiæ terminalis axe elongato, *post fructificationem radices et caules foliosos novellos juxta apicem gignente.* Neque flores nec fructus suppetebant.

Hab. Crescit prope fl. Brasinho mens. Nov. (N. 568 *a.*)

These specimens were dried solely on account of their curious morphology. It occasionally happens in a few genera of Orchids that the axis of the spike will bud after flowering, instead of dying down; in the present case this seems to be the rule, and not exceptional.

Bletia catenulata, Ruiz & Pav. Fl. Peruv. Syst. p. 229.

Hab. In graminosis udis ad campos de Tapirapuan floret mens. Sept. (N. 388.)

The flowers are somewhat smaller and the leaves narrower than is the case with typical *catenulata*, but I agree with Mr. Rolfe in considering these insufficient grounds for making a new species. [Guiana, Peruvia.]

Rodriguezia secunda, H. B. K. Nov. Gen. et Sp. i. p. 367.

Hab. Viget in sylvâ primævâ inter Santa Cruz et Campos de Tapirapuan, ubi mens. Sept. florescit. (N. 349.) [Amazonia, Guiana, N. Grenada, Amer. Centr., Ind. Occ.]

Notylia lyrata (sp. nov.) (Tab. XXXII. figg. 4–10); pseudobulbis parvis, oblongo-linearibus, a vaginis supremis superatis; foliis coriaceis, nunc linearibus nunc lineari-oblongis obtusiusculis; pedunculis gracilibus folia subæquantibus, vaginis 2–3 distantibus instructis; sepalis lateralibus ad $\frac{3}{4}$ connatis, apice fere rectis; labelli breviter unguiculati laminâ lyratâ, margine planâ, cristam laminatam editam dimidio proximali proferente; columnâ apice recurvâ.

Hab. Inveni prope fl. dos Bugres mens. Oct. florescentem. (N. 438.)

Pseudobulbi vix ultra 1·0 cm. long., sicci 0·3 cm. lat., compressi, vaginis ad 1·5 cm. long. occlusi. Folia imparia, maxima 9·0, minima 4·5–5·5 cm. long., 0·7–1·3 cm. lat., basi ad 0·3 cm. coarctata, in sicco corrugata. Racemi nutantes, pluriflori, deorsum vaginati. vaginis ovatis, acuminatis, laxe amplexicaulibus, 7·0 cm. long. Bracteæ modicæ. Pedicelli 0·3 cm. long., patuli vel decurvi. Flores circa 0·5 cm. diam., dilute crocei. Sepala linearia, acutiuscula, 0·45 cm. long., posticum quam lateralia paullo brevius. Petala lineari-lanceolata, acuta, sep. lateralibus parum breviora. Labelli sep. lateralia æquantis unguis 0·1 cm. long.; lamina 3·0 cm. long., e basi levissime cordata, sensim angustata, sursum subito ampliata, apice obtusa. Columna a petalis fere duplo superata, antice sulcata, basi ipsâ incrassata, sursum subito recurvata. Antheræ vix 0·2 cm. long., appendicula membranacea rostellum amplectens.

Juxta *Notyliam Barkeri*, Lindl., intercalanda, abs quâ abhorret, præter alia, floribus minoribus, sepalis lateralibus apice fere rectis, labellique laminâ dispari. [Mexico.]

Notylia bisepala (sp. nov.); pseudobulbis oblongis, superne angustatis, vaginis plerumque quam ipsi brevioribus cinctis; foliis lineari-oblongis vel ovato-oblongis, obtusis, pseudobulbos excedentibus, subcarnosis; pedunculis folia excedentibus vel subæquantibus, deorsum vaginis 3–4 laxis distantibus instructis; sepalis lateralibus apice ipso solummodo liberis; labelli, quam sepala distincte brevioris, longe unguiculati, laminâ e basi truncatâ, pubescente, triangulari-acuminatâ, obscure callosâ vel omnino ecallosâ, margine recurvâ; columnâ fere rectâ.

Hab. Juxta Santa Cruz lecta, itaque in sylva primæva inter Santa Cruz et Campos de Tapirapuan; floret menss. Sept. et Oct. (Nn. 387, 511.)

Pseudobulbi ad 2·0 cm. long., compressiusculi, in sicco longitudinaliter alti striati. Folia maxime inæqualia, majora ad 14·0 cm. long., minima nec ultra 5·0 cm., pleraque 1·5–2·3 cm. lat., in sicco punctis albidis leviter elevatis conspersa. Racemi nutantes vel ascendentes, pluriflori, puberuli; eorum vaginæ ovatæ, acuminatæ, 0·6–0·7 cm. long. Bracteæ modicæ. Pedicelli 0·6 cm. long., erecti vel curvati, minute puberuli. Flores lutei, circa 0·7 cm. diam. Sepalorum lateralium lamina sep. posticum lanceolatum acutiusculum excedens, ovato-cuspidata, apice brevissime bifida, 0·65 cm. long. Petala sep. lateralium laminam æquantia, lineari lanceolata, acuminata. Labellum totum 0·45 cm. long.; unguis ejus superne sensim laxatus, 0·15 cm. long., obscure callosus vel ecallosus, lamina basi 2·0 cm. lat. Columna quam unguis labelli vix dimidio longior, antice excavata, ima basi dilatata. Antheræ appendicula rostellum amplectens.

Non dubito quin spectet ad *N. Huegelii*, Reichb. f., quæ, fide beat. auctoris, eadem est ac *N. tridachne*, Lindl. Planta Mexicana vero floribus majoribus et petalis falcatis, neque rectis nec acuminatis, et labelli angustioris laminâ manifestius callosâ gaudet. [Mexico.]

Lockhartiæ sp. indet. (forsan *L. goyazensis*, Reichb. f., vel *L. elegans*. Hook.). Flores jam dilapsi.

Hab. Santa Cruz, Nov. (N. 692.)

DICHÆA CORNUTA (sp. nov.) (Tab. XXXII. figg. 1–3); caulibus erectis; foliis mediocribus, linearibus, obtusis, pedunculis folia subæquantibus; sepalis et petalis lanceolatis, acutis, his quam illa paullulum brevioribus; labelli longe unguiculati laminâ rotundatâ, brevissime cuspidulatâ, basi longiuscule incurvo-cornutâ; columnæ pede brevissimo; clinandrio breviter lobulato; capsulâ oblongâ, lævi.

Hab. Incolit ripam fl. Brasinho, ubi flores præbet mens. Oct. (N. 459.)

Caulis ad 22·0 cm. long., modice foliosus. Foliorum vaginæ ±1·0 cm. long., cauli satis arcte applicatæ; laminæ circa 2·0 cm. long. et 0·4 cm. lat. basi parum coarctatâ. Pedunculi modici, ipso sub flore paullulum incrassati. Flores circa 1·0 cm. diam., albidi, purpureo-maculati. Sepala 0·85 cm. long., vix ad 0·3 cm. lat. Labellum 0·6 cm. long., unguis ejus late linearis, basi levissime angustatus, 0·35 cm. long.; lamina margine undulata, incurva, 0·45 cm. lat., ejus cornua pro genere sat elongata, falcato-semicirculata, 0·2 cm. long. Capsula 1·0 cm. long., 0·5 cm. lat., subanceps, omnino glaber. Columna vix 0·2 cm. alt. Pollinia non vidi.

Species habitu et capsulis glabris cum *D. graminoidi*, Lindl., satis congruens, floribus vero disparibus gaudet. [Guiana, Ind. Occ.]

VANILLA ENSIFOLIA ?, Rolfe, in Kew Bull. 1892, p. 141. (Tab. XXXIII. fig. 6.) Speciebus ab omnibus hucusque notis, *V. ensifoliâ* exemptâ, discrepat de foliis linearibus. Nec flores nec fructus vidi.

Hab. Inveni in ripâ fl. Paraguay, haud procul a Tres Barras, mens. Oct. (N. 657 *a*.)

This is a very interesting and remarkable species, quite different from the general run of Vanillas, and strikingly similar in foliage to the species recently described by Rolfe. [N. Grenada.]

[*V.* sp., forsan *V. planifoliæ*, Andr., legi mens. Aug. juxta urbem Cuyabá specimina floribus et fructibus carentia.]

STENORHYNCHUS AUSTRALIS, Lindl. Gen. et Sp. Orch. p. 477.

Hab. Crescit prope urbem Cuyabá, ubi florentem reperi mens. Aug. (N. 66.)

SPIRANTHES GRANDIFLORA, Lindl. Bot. Reg. t. 1043.

Hab. In angustiis montium Serra da Chapada, necnon in cacumine eorundem, mens. Aug. flores profert. (Nn. 190, 191.) [Bras. Or.]

PHYSURUS OREADUM (sp. nov.); caule ascendente, folioso, deorsum vaginis foliorum evanidorum instructo; foliis lanceolatis vel ovato-lanceolatis, acuminatis, basi gradatim coarctatis, siccitate rubescentibus, brevipetiolatis, petiolo subito vaginato-dilatato; spicâ densiflorâ, anguste lineari, foliis duplo excedente; bracteis lanceolatis, acuminatis, pedicellis duplo longioribus; floribus mediocribus; sepalis suberectis, lanceolatis, obtusis, sepalo antico quam lateralia paullulum longiore; petalis sepala subæquantibus, lineari-oblanceolatis, obtusis, cum sepalo postico in galeam conniventibus; labelli longe clavellato-calcarati limbo lyrato, laminâ terminali rotundatâ, vix lunatâ.

Hab. Crescit in sylvâ primævâ inter Santa Cruz et Campos de Tapirapuan, ubi florentem reperi mens. Sept. (N. 373.)

Tota planta circa 40·0 cm. alt. Caulis crassiusculus, siccitate nigricans, et nunc ad 0·35 cm. lat. compressus, puberulus, e nodis infimis radices sat validas, fere simplices dense piliferas emittens; internodia pleraque 2·0–3·0 cm. long. Foliorum vaginæ 1·2–1·5 cm. long., circa 1·0 cm. lat., ad 0·6–0·7 cm. circum caulem continuæ, tenuiter membranaceæ, obsolete puberulæ, vix decolores. Foliorum lamina supra vaginam ad 1·5 cm. petiolata, petioli 0·2–0·3 cm. lat., juveniles albido-ciliati, mox glabri. Lamina ipsa circa 11·0 cm. long. et 2·5–3·5 cm. lat., membranacea, fere a basi 3–(5)-nervis, puberula, dein glabra. Spica 18·0 cm. long., 2·0 cm. lat., deorsum vaginis paucis laxe amplectentibus obtecta, pubescens. Bracteæ fere 1·0 cm. long., uninerves. Pedicelli recti, vix 0·5 cm. long., ovario duplo breviores. Sepala 0·5 cm. long., 0·13 cm. lat., ad 0·3 cm. decurrentia. Labelli, ad 0·15 cm. in columnâ adnati, limbus 0·35 cm. long., infra medium 0·2 cm. lat., hinc fere ad 0·1 cm. attenuatus; lamina terminalis 0·25 cm. lat., minute ciliolata; calcaris pars libera 0·8 cm. long., leviter clavata, apice brevissime acutata. Pollen sectile. Capsula oblonga, 0·8 cm. long.

Arcte affinis *P. densifloro*, Lindl., mihi cognito modo icone in herb. Lindl., quæ speciem adumbrat nostrâ a stirpe abhorrentem de habitu humiliore, spicâ abbreviatâ, floribus longius pedicellatis, labelli laminâ terminali sagittata, petalis latioribus, calcare ovario longiore in eo longius adnato. Habitus et folia plantam a cl. Glaziou lectam (N. 12204) in mentem revocant, sed spica major necnon sepala et labellum disparia. [Bras.]

ZINGIBERACEÆ.

COSTUS ACAULIS, sp. nov. (Tab. XXXIII. figg. 1–5); caule brevissimo; foliis infimis ad vaginas late ovatas, laxe amplexicaules, piloso-pubescentes imminutis; foliis superioribus paucis (4–5) rosulatis, elongatis, oblongo-obovatis, obtusis vel acutis, tenuiter membranaceis, mox supra pilosis vel fere omnino glabris, subtus, præsertim in nervo mediano, pilosis, margine ciliatis; foliis supremis paucissimis quam majora saltem duplo brevioribus; inflorescentiâ confertâ, haud strobiliformi, floribus paucis in apice caulis foliis parvis bracteas simulantibus cinctis; pedicellis bracteolâ lanceolato obovatâ, breviter bifidâ, membranaceâ instructis; calyce tubuloso, bracteolam superante, ultra medium bifisso, laciniis ovato-lanceolatis, breviter acuminatis, laciniâ tertiâ duabus alte connatis paullo minore; labello majusculo amplo, fere suborbiculato, margine undulato, tenuissimo et pellucidissimo, deorsum puberulo; stamine petaloideo, integro, anguste oblongo-oblanceolato, breviter acuminato; antherâ basin versus connectivi affixâ; ovario juxta apicem pilis albidis dense obsito, 3-loculari; ovulis pluribus 3-4 (–2?)-serialibus dissepimento insidentibus; stylo filiformi, glabro; stigmate expanso-infundibuliformi.

Hab. Crescit in fruticetis arenaceis prope Santa Cruz, ubi floret mens. Nov. (N. 679.)

Folia infima (vaginæ) usque ad 3·5 cm. long., tenuia, folia majora ad 18·0 cm. long.,

pellucida, in sicco viridia, supra medium 6·0–7·5 cm. lat., facie superiore lepidibus minutis albis inspersa, lepide nervosa. Folia floralia, bracteolæ, et sepala deorsum subtiliter maculata, illa circa 3·5 cm. long., oblongo-spathulata, piloso-pubescentia. Bracteola vix 2·0 cm. long., fere usque ad 0·3 cm. bifida. Calyx 2·2 cm. long., ad 1·3 cm. bifissus, segmento majore ad 0·3 cm. bifido. Petala 5·0 cm. long., lanceolata. Labellum 7·0 cm. long., circa 4·0 cm. diam., superne gradatim laxatum, luteum. Stamen 2·7 cm. long., tenuissimum, nervosum. Antheræ lineares, circa 0·5 cm. long.; loculi basi divergentes, superne attenuati ibique in cristam elevatam abeuntes.

Ab affini *Costo pumilo*, Petersen, abhorret, præter alia, foliis pellucidis, majoribus, diversiformibus, fere glabris nec hirsutis, in sicco viridibus nec subrubescentibus, labelloque minore gradatim nec subito in tubum attenuato. [Bras. Or. vel Goyaz.]

C. pumilus was described by Petersen from specimens without flowers. There are flowers at Kew, carefully preserved by Burchell, hitherto the only collector of the plant, but the material is scarcely enough to warrant dissection. Nevertheless I feel satisfied from careful examination of the dried flowers that Burchell's plant, although undoubtedly closely allied to mine, has somewhat different flowers, to say nothing of the leaves. Unless I am mistaken, there is but one other acaulescent *Costus* in our herbaria, and that is an African one at Kew.

Burchell's specimens were gathered between the river Paranahiba and Goyaz. The former being in the province of Minas Geraes and thus in the South Brazilian botanical province, while the latter is in the North-Brazil—Guiana province, it is impossible to say of which province *C. pumilus* is a native.

In the analysis of this Plate I have diligently sought to represent the flower correctly, the stamen alone costing several hours' labour to dissect out. The task of making out with precision the delicate parts of such a flower is, however, such a difficult one that the analysis may perhaps be defective, especially as regards the petal.

Costus pubescens (sp. nov.); caule leviter spirali, crasso, vaginis pubescentibus in ochream productis omnino obtecto; foliorum modicorum spiralium vaginatorum subsessilium laminâ plerumque oblanceolato-oblongâ, apice acuminatâ, dimidio inferiore gradatim attenuatâ (nonnunquam minore, late ovatâ obtusâ), pubescente, cito puberulâ vel glabrâ; inflorescentiâ in caule folioso terminali brevi nec ultra 5·0 cm. longâ; bracteis laxis, subrectis, late ovatis obtusis, puberulis, inferioribus laminâ frondosâ magnâ hinc gradatim imminuente coronatis; floribus inclusis (forsan vero subexsertis), ample bracteolatis; calyce tubuloso, breviter ac pariter trifido; stamine oblongo, haud petaloideo.

Hab. Juxta ripam fl. Paraguay, inter Santa Cruz et Villa Maria, flores præbuit mens. Dec. (N. 813.) *Grana de Macaco* incolarum.

Orgyalis, sursum sæpe ramosus. Caulis erectus circa 0·5 cm. diam. Vaginæ pleræque 2·0–4·0 cm. long., arcte applicatæ; ochreæ nunc brevissimæ vel obsoletæ, nunc ad 0·3–0·4 cm. long., margine lanato-ciliatæ. Foliorum lamina usque ad 16·0 cm. long., minimæ vero nec ultra 5·0–6·0 cm. non absunt, plerumque 3·0–5·0 cm. lat., membranaceæ, in sicco plus minus rubescentes. Bracteæ (laminâ frondosa exemptâ)

circa 2·5 cm. long. et 2·0 cm. lat., lamina frondosa usque ad 8·0 cm. long., plerumque vero minor. Bracteola vix 2·0 cm. long., 0·6 cm. lat., navicularis. Calyx 0·8–1·0 cm. long., 0·6 cm. lat., ad 0·2 cm. trifidus; lobi triangulari-rotundati, obtusi. Labellum (an maturum?) 1·5 cm. long., album, fauce purpureum, juvenile ovatum, acuminatum.

Species forsan cum *Costo discolore*, Rosc., componenda, distans vero vaginis pubescentibus, bracteis latioribus, floribus paucis, etc. [Amazonia.]

Apud incolas caulis exsuccus pro remedio efficace contra gonorrhœam habetur.

Renealmia foliosa (sp. nov.); caule valido ascendente altitudinis prætermissæ, terete, glabro; foliis magnis, longe vaginatis, vaginis laminam haud attingentibus, laminâ oblongo-oblanceolatâ, basi inæquilaterâ, sensim rotundato-angustatâ, margine spinuloso-denticulatâ, glabrâ; costâ mediâ supra excavatâ, subtus maxime eminente; scapo, e rhizomate arcuatim ascendente, foliis pluries breviore, pubescente, deorsum vaginis aphyllis laxis imbricatis in longitudinem eminenter nervosis glabris instructo; floribus sparsiusculis, bracteis elongatis oblongis acutis membranaceis puberulis, floribus racemosis pedicellatis; pedicello circa duplo breviore, pubescente; paracalyce bifisso, extus pubescente; calyce tubuloso, pubescente, trilobo, lobis triangulari-ovatis acutis; corollæ tubo calyci vix æquilongo, laciniis ovato-oblongis, obtusis, erectis, laciniâ intermediâ lateralibus paullo latiore; labello corollam æquante longe ac late unguiculato; limbo rotundato, inæqualiter 3-lobo, lobis lateralibus mediano majoribus; staminodiis linearibus, erectis, basi labelli insidentibus; antherâ liberâ, rectangulari, pubescente; stylo basi a nectario brevi incrassato cincto, superne, inter loculos antheræ abscondito, gracili; stigmate reniformi, oblique excavato; ovario velutino-tomentoso.

Hab. Crescit in angustiis ad Serra da Chapada, ubi flores præbuit mens. Aug. (N. 204.)

Caulis basi 3·0 cm. diam., et folia circa octo proferens. Folia magna, metralia, 15·0 cm. lat., firme membranacea, petiolis circa 3·0 cm. long. validis fulta. Scapus coccineus, 30·0 cm. long., basi 0·6 cm. diam.; vaginæ infimæ modo 1·5–2·5 cm. long., superiores 6·0 cm. attingentes, obtusæ, extus juxta apicem puberulæ, in sicco papyraceæ, vivæ purpureæ. Bracteæ mediocres, circa 4·0 cm. long., subtiliter nervosæ, rectæ vel subpatulæ. Pedunculi plerique 1·0–1·5 cm. long., ascendentes. Paracalyx 2·0–3·0 cm. long., 1·0 cm. diam. Calyx 2·0 cm. long., ad 0·6 cm. trifidus. Corolla vix 3·0 cm. attingens, extus puberula, labello ochraceo exempto coccinea; lacinia intermedia 0·75 cm. long., 0·6 cm. lat., laciniæ laterales altius connatæ, interdum ad 0·55 cm. inter se liberæ. Labellum 1·0 cm. long.; lamina vix 0·3 cm. long. et 0·6 cm. lat.; unguis 0·7 cm. long., 0·35 cm. lat., pulvinato-incrassatus. Staminodia 0·3–0·35 cm. long., uninervia. Anthera 0·75 cm. long., 0·4 cm. lat. Stigma 0·3 cm. lat. Nectarium vix 0·15 cm. alt., 0·3 cm. diam.

Ex affinitate *R. exaltatæ*, Linn. f., et *R. bracteosæ*, Griseb., ab ambâbus vero facili obtutu dignoscenda foliis laterioribus basi subrotundatis, spicâ abbreviatâ vaginas minores sustinente, labello diversiformi, ovario velutino-tomentoso nec glaberrimo, nectario modo 0·15 cm. alto, necnon florum colore. [Bras. Or., Amazonia, Guiana, Ind. Occ.]

RENEALMIA HOLDENI (sp. nov.); rhizomate obscure noduloso, squamulis laxis instructo; foliis distichis, longe vaginantibus, vaginis truncatis laminam attingentibus vel fere attingentibus, laciniis lineari-lanceolatis apice longe acuminatis, deorsum sensim coarctatis, fere omnino glabris; scapo radicali leviter scabriusculo vaginis aphyllis subremotis instructo; inflorescentiâ pluriflorâ, subracemosâ, elongatâ, angustâ, bracteas lanceolatas vel ovatas proferente; pedunculis quam bracteæ suffulcientes duplo vel triplo brevioribus, erectis, scabriusculis, 1–2-floris; floribus parvis, a bracteis amplis secundi ordinis fultis; pedicellis ovarium subæquantibus, superne leviter incrassatis; calyce ut in *R. occidentali*, Griseb.; corollæ tubo quam calyx breviore, laciniis oblongo-obovatis obtusis, margine ciliatis, laciniâ intermediâ quam laterales paullo minore; labello lacinias corollæ subæquante, obovato obtuso, breviter trilobo, undulato, late unguiculato, stamen $\frac{1}{2}$-amplectente; ovario anguste ellipsoideo, pubescente, quam calyx $\frac{1}{3}$-plo breviore; stylo filiformi basi a nectario parvo cylindrico 3-lobo cincto; stigmate late reniformi.

Hab. Crescit ad Santa Cruz, necnon in sylvis vicinis, flores præbens menss. Nov.–Dec. (N. 680 *a.*)

Foliorum lamina ad 28·0 cm. long. (plerumque vero circa 20·0 cm.) et vix 3·0–4·5 cm. lat.; costa media supra impressa, subtus eminens. Scapus circa 25·0 cm. alt., 0·25 cm. diam., vaginæ 3·5–6·0 cm. long., apice truncatæ. Bracteæ inferiores ad 2·5 cm. long., superiores 1·0 cm., subscariosæ. Bracteæ secundi ordinis circa 0·5 cm. long., margine ciliatæ vel calvæ. Calyx 0·6 cm. long. Corolla 1·2 cm. long. Labelli lamina vix 0·4 cm. ungue 0·15 cm. long., basi breviter pulvinata. Anthera 0·4 cm. long. Stigma ad 0·1 cm. lat. dilatatum.

A *R. occidentali*, Griseb., cui affinior, abhorret, foliis minoribus, inflorescentiâ subracemosâ, rhachide scabriusculâ nec pubescente, labello trilobo longius et minus late unguiculato, breviter pulvinato, nectario parvo, etc. Arctius accedit ad *R. occidentalem*, var. *Paco-secora*, cujus pedunculi uniflori vel infimi biflori inflorescentiam fere racemosam constituunt. [Amazonia, Guiana, Amer. Centr., Ind. Occ.]

Named in honour of Mr. N. Lofft Holden, who conducted our boat up to Santa Cruz, and first brought this plant to me.

MARANTACEÆ.

ISCHNOSIPHON NEMOROSUS (sp. nov.); inflorescentiâ folio magno fultâ, vaginâ brevi, angustâ, intus glabrâ, articulum haud attingente; petiolo valido, ubi in articulum abit annulo pilifero instructo; laminâ e basi rotundatâ, inæquilaterâ, elongatâ, lanceolato-oblongâ, ubi in articulum abit supra late (haud profunde) canaliculatâ, superne sensim attenuatâ, acutâ, inæquilaterâ, apice maxime obliquâ, glabrâ, spicis numerosis, angustis, confertis, plurifloris; inflorescentiâ quam lamina folii suffulcientis plerumque plus quam 2-plo breviore; bracteis oblongis vel oblongo-oblanceolatis, acutis vel mucronato-obtusis, concavis, laxe imbricatis, pubescentibus, pergamaceis; corollæ tubo, sepalis $\frac{1}{2}$-plo longiore, sursum puberulo; petalis oblongo-oblanceolatis, obtusis, glabris; staminodio calloso amplo; staminodii cucullati auricula

curvata; stamine fertili appendice parva petaloidea superne angustata, basin antheræ attingente instructo.

Hab. Crescit in sylvâ primævâ juxta Santa Cruz. (N. 350.)

Planta formosa, $1\frac{1}{2}$-metralis. Folia basalia ignota. Exemplariorum meorum scapus usque ad basin vaginæ folii inflorescentiam suffulcientis 14·0 cm. long., 0·6 cm. lat. Vagina 12·0–16·0 cm. long., circa 1·5 cm. lat. (petiolo incluso), passim piloso-pubescens, imâ basi et superne, ibique præsertim in margine, villosulo-pubescens. Petiolus e vaginâ usque ad articulum 16·0–20·0 cm. long., stramineus. Articulus 4·0–5·0 cm. long., minutissime puberulus, ubi in laminam transit margine pubescens. Lamina ultra 40·0 cm. long., basi 14·0–15·0 cm. lat., ipso sub apice ad 4·0–5·0 cm. attenuata, in sicco pallide glaucescentia, crebre nervosa, margine paullulum cartilaginea, juxta apicem ciliata; nervus medius supra excavatus, subtus valde prominens. Inflorescentia fere ad 20·0 cm. long., pluri- ac maxime confertiramea. Bracteæ pleræque 1·5–2·8 cm. long., bruneæ. Bracteolæ circa 1·2 cm. long. Flores exserti. Sepala linearia, obtusa, 1·0 cm. long. Corollæ tubus 1·6 cm. long., medio manifeste dilatatus. Flores albi. Petala 0·55 cm. long., 0·35 cm. lat., margine crispula. Staminodium callosum obovatum, 0·6 cm. long., callo laminato triangulari 0·1 cm. alt. unilateraliter auctum. Staminodium cucullatum vix 0·4 cm. long., appendice 0·1 cm. long. Staminis fertilis appendix petaloidea 0·2 cm. long., basi 0·1 cm. lat., sub antherâ fere evanida. Anthera oblonga, obtusa, 0·2 cm. long. Ovarium apice pilis sericeis flavicantibus instructum. Capsulam non vidi.

Ab *Ischnosiphone plurispicato*, Koern., divergit foliorum laminis majoribus latioribus basi ubi in articulum abeunt, supra late (nec profunde) carinatis ibique glabris, petiolo supra vaginam elongato, bracteis paullo longioribus pubescentibus, floribus longius exsertis, sepalis angustioribus haud maculis bruneis conspersis, corollæ majoris tubo longiore (corollæ tubus speciminis Riedeliani vix 1·2 cm. attingit). *I. laxus*, Koern., præter alia, spicis laxis gaudet, quæ etiam in *I. guianensi*, Koern., pauciores esse enarrant. [Bras. Or.]

ISCHNOSIPHON CONCINNUS (sp. nov.); folii inflorescentiam suffulcientis vaginâ sat lata, articulum nequaquam attingente, villosulo-pubescente, superne intus appresse villosulâ, petiolo vaginæ subæquali vel quam ea breviore, minutissime pubescente vel puberulâ; articulo longo a petiolo annulo nullo separato; laminâ lanceolatâ vel oblongo-lanceolatâ acuminatâ, sursum sensim attenuatâ, inæquilatera, apice fere rectâ, basi rotundato-acutatâ; inflorescentiâ, e spicis parvis pluribus, dense confertis, diversæ altitudinis, insertis composita, in ambitu obovatâ, quam lamina 3–4-plo breviore, spicis ramosis; bracteis lanceolatis acuminatis, pubescentibus (præcipue sub margine) vel subglabris, concavis, pergamaceis; corollæ tubo sepalis 2-plo longiore sursum valde torto, glabro, petalis oblongis obtusis, glabris; staminodio calloso anguste obovato; staminodio cucullato, staminodium callosum excedente, prope apicem incurvo-auriculato; stamine fertili anguste petaloideo.

Hab. Crescit in cacumine montium Serra da Chapada, prope Santa Anna da Chapada, alt. circa 700 met. supra mare. Floret mens. Aug. (N. 90.)

Caulis teres, lævis. Folia basalia (ex schedis meis) petiolis circa $\frac{2}{3}$-metralibus fulta. Scapus erectus, $1\frac{1}{3}$ metralis, 0·3 cm. diam. Vaginæ foliorum inflorescentiam suffulcientium 6·0–8·0 cm. long., 1·5 cm. lat., petiolus inter vaginam et articulum 3·0–6·5 cm. long. (raro modo 1·5 cm.), articulus 2·0–3·0 cm. long., 0·25 cm. diam. Lamina ad 32·0 cm. long., in medio 7·0–8·5 cm. lat., valde inæquilatera, in sicco pallide glaucescens, subtus decolor; costa media supra excavata, subtus eminens. Inflorescentia 6·0–10·0 cm. long. (raro 10·0 cm. attingit), superne 4·0–6·0 cm. lat. pubescens. Bracteæ 2·0–2·5 cm. long. Bracteolæ 1·0 cm. long., naviculares, uno latere puberulæ. Flores punicei. Sepala 0·45 cm. long., oblongo-lanceolata, acuta vel obtusiuscula. Corollæ tubus 1·0 cm. long., superne gradatim et leviter attenuatus. Petala 0·3 cm. long. Staminodium callosum 0·3 cm. long., callo parvo instructum. Staminodium cucullatum longe unguiculatum, 0·45 cm. long., auriculâ 0·1 cm. long. Ovarium apice pubescens.

Certe juxta *Ischnosiphonem densiflorum*, Koern., speciem Mattogrossensem, interponenda, cujus flores adhuc ignoti, sed caulis ex cl. Petersen breviter hirtus ac verrucoso-asperulus, vaginæ articulum attingunt, lamina folii inflorescentiam suffulcientis longior et latior, et bracteæ modo 1·6–1·8 cm. long. [Matto Grosso.]

Ischnosiphon argenteus (sp. nov.); caule e rhizomate crasso, elato, a vaginis strictis elongatis ensiformibus cincto; foliorum basalium vaginâ sat latâ, quam petiolus breviore, obsolete pruinosâ; petiolo gracili, obscure farinoso; articulo elongato, a petiolo nullo annulo separato, farinoso; laminâ inæquilaterâ, e basi latâ, rotundatâ ovato-lanceolatâ, acuminatâ, apice subrectâ, subtus albo-farinosâ, supra obsolete pruinosâ, superne puberulâ; folio inflorescentiam fulciente parvo ample vaginato, vaginâ articulum brevem attingente; inflorescentiâ e spicâ gracili, solitariâ, brevi, basi subnudâ, paucIflorâ, obsolete puberulâ constante; bracteis subdistantibus, oblongo-oblanceolatis, convolutis, subtiliter nervosis, obsolete pruinosis; floribus exsertis; corollæ tubo elongato, gracillimo, sepala duplo excedente; petalis elongatis, lineari-lanceolatis, obtusis; staminodio calloso oblongo-ovato, elongato, callo parvo aucto; staminodio cucullato quam staminodium callosum duplo breviore, subclavato-auriculato; stamine fertili petaloideo, oblanceolato, antherâ brevi aucto; stylo curvato; ovario apice pilis sericeis spissis instructo.

Hab. Crescit in sylvestribus juxta Santa Cruz, mens. Sept. florens. (N. 344.)

Rhizoma ultra 1·0 cm. diam., radices simplices 0·1 cm. diam. emittens. Vaginæ aphyllæ, caulem occludentes, inferiores 3·0–13·0 cm. long., superiores 27·0–45·0 cm. long., caulem arcte amplectentes, apice truncato-emarginatæ. Folii basalis vagina a vaginâ aphyllâ superiore superata, vix 1·0 cm. lat., in apice ipso albido-villosa, ceterum glabra, superne intus lateritio-nervosa; petiolus supra vaginam 15·0 cm. long., 0·3 cm. diam.; articulus 3·0 cm. long., 0·3 cm. lat., in sicco sordide puniceo-bruneo-pruinosus; lamina circa 30·0 cm. long., medio 13·0 cm. lat.; costa media basi ipsâ hirsuta. Vagina explanata folii inflorescentiam suffulcientis 4·5 cm. long., 0·8 cm. lat., superne angustatæ, articulus 0·6 cm. long., 0·15 cm. lat.; lamina 12·0 cm. long. et lat. dimidio minor, basi inæquilatera. Spica 11·0 cm. long., cujus pedunculus

4·0 cm. attingit. Bracteæ 2·0–2·5 cm. long., puberulæ. Flores albidi. Sepala anguste linearia, acuminata, 1·5 cm. long., 0·05 cm. lat. Petala 1·2 cm. long. Corollæ tubus vix 3·0 cm. long., dimidio inferiore modo 0·05 cm. long., superne leviter et sensim amplificatus, sub limbo 0·12 cm. lat. Staminodium callosum vix 1·0 cm. long. Staminodium cucullatum 0·5 cm. long., auriculâ 0·25 cm. long. Stamen fertile staminodium cucullatum subæquans; anthera (an tota?) 0·05 cm. long. Stylus 0·05 cm. crassus. Stigma subcuneiforme, vix 0·1 cm. long.

Speciem cum *Ischnosiphone leucophæo*, Koern., *I. surinamensi*, Koern., et *I. ovato*, Koern., componendam, tamen ab omnibus spicâ tenui, paucиflorâ, solitariâ, basi fere nudâ, nec vaginas plures aphyllas sustinente, inter multa alia, nullo negotio cognoscere potes. [Bras. Or., Amazonia.]

MARANTA POHLIANA, Koern., in Bull. Soc. Nat. Mosc. 1862, p. 44 (nec *M. divaricata*, Rosc. Scit. tab. 27.)

Hab. Floret in ripâ fl. Paraguay, inter Santa Cruz et Diamantino, mens. Oct. (N. 510.)

M. Pohliana a *M. divaricatâ*, quacum cl. Petersen eam conjungebat, distare videtur ob folia minora et sepala multo minora et tubum corollæ excedentia, necnon ob corollæ tubum breviorem et florem totum minorem itaque ovario viridi albo-sericeo nec villoso-tomentoso gaudet. Equidem cl. Petersen ipse dicit *M. Pohlianam* inter *M. divaricatam* et *M. foliosam* medium tenere videtur.

Nescio cur cl. Petersen stirpem a cl. Glaziou lectam (n. 12214) ad *M. divaricatam* refert, cujus sepala enarrat "13 mm." attingere, quum ea speciminis Glazioviani vix ad 5·5 mm. pertineant. An hæc planta potius ad *M. Pohlianam* referenda?

Eamdem speciem ante oculos habui a cl. Gardner in Brasilia Or. lectam (n. 1854), et a cl. Burchell (Nn. 6857, 6714). [Bras. Or.]

MARANTA LONGISCAPA (sp. nov.); caule recto, humili, simplici vel e basi tuberosâ ramoso; foliis homotropis in vaginâ sessilibus vel brevissime petiolatis, vaginis amplis apice sæpe breviter auriculatis, dorso pubescentibus vel pubescenti-hirsutis, intus fere glabris; articulo brevissimo, facie ad axin spectante villosulo; laminâ lanceolatâ vel ovato-lanceolatâ, breviter acuminatâ, inæquilaterâ, apice subrectâ; costâ mediâ, facie inferiore pubescente exemptâ, fere glabrâ; inflorescentiæ rhachide gracili, erectâ, folia pluries excedente, puberulâ vel breviter pilosâ; bracteis internodia excedentibus vel æquantibus vel quam ea paullo brevioribus, oblongo-ovatis, plerisque apice late truncatis, nonnunquam emarginatis, rhachidem laxe amplectentibus, membranaceis, minute pubescentibus puberulisve; sepalis oblongo-lanceolatis, acutiusculis, apice decoloribus; corollæ tubo sepala subæquante, sursum ampliato; staminodiis externis obovato-oblongis, obtusis, fere æquilongis; staminodio calloso quam staminodium cucullatum paullo longiore, auriculâ obtriangulari; ovario albide sericeo-tomentoso.

Hab. Reperi in ripâ fl. Paraguay prope Santa Cruz mens. Oct. florentem. (Nn. 439, 631.)

Sepala lanceolata, 2·5–3·0 cm. long., 5-nervia, apice 1-nervia. Corollæ tubus 0·25 cm. long., sub limbo 0·1 cm. lat. (basi vix 0·05 cm.). Tuber, ex schedis meis anguste ovoideum, siccum potius videtur oblongum, tunicis ovatis, acuminatis, imbricatis, fragilibus, vivis pallide bruneis obtectum, radices plagiotropicas, radicillos perbreves ferentes, vel fere omnino simplices emittens. Caules usque ad 10·0 cm. alt., sæpe vero humiliores. Vaginæ caulem occludentes sursum gradatim elongatæ, usque ad 8·0 cm. long., apice integræ vel brevissime bifidæ, nonnunquam mucronulatæ. Foliorum vaginæ explanatæ 0·8–vix 1·0 cm. lat., in margine plus minus villosulo-ciliatæ; articulus 0·1 cm. long. (folii unici vero 0·3 cm.); petiolus plerumque 0·1 cm. long. (folii unici 1·0 cm. long.); lamina ad 9·5 cm. long., mediocres circa 7·0 cm., medio ad 3·0 cm. diam. (plerumque vero angustior); costa media basi inordinate incrassata, cito attenuata. Inflorescentiæ rhachidis usque ad 25·0 cm. long., 0·75–1·0 cm. lat. Bracteæ 1·2–2·6 cm. long., superiores gradatim imminutæ, imâ basi pubescentes vel hirsutulæ, rarius puberulæ vel glabræ. Pedicelli pæne omnino glabri. Flores albi; staminodia purpureo- et luteo-maculata. Sepala 2·5–3·0 cm. long., 5-nervia, apice 1-nervia. Corollæ tubus 0·25 cm. long., sub limbo 0·1 cm. lat. (basi vix 0·05 cm.). Staminodia externa 0·5 cm. long., 0·25 cm. lat. Staminodium callosum 0·35 cm. long., ecallosum, trilobum, lobo medio majore, lobis lateralibus æqualibus. Staminodium cucullatum lineari-lanceolatum, auriculâ 0·2 cm. long. appendiculatum. Antheræ oblongæ, brevissime mucronulatæ, 0·1 cm. long. Ovarium triquetrum vel subanceps, 0·2 cm. long. Stylus incrassatus. Stigma securiforme.

Maranta bicolor, Ker, quam planta nostra de habitu necnon signis aliis levioris momenti aliquanto simulat, foliorum articulos multo majores, spicas breves paucifloras, bracteas longiores acutas nec amplas et apice truncatas, pedicellos pubescentes, corollæ majoris tubum triplo latiorem ostendit. [Bras. Or., Amazonia, Guiana.]

Thalia geniculata, Linn. Sp. Pl. ed. I. p. 1193.

Hab. In paludosis prope Corumbá mens. Jan. floret. (N. 909.) [Amer. Trop. et Subtrop., Ind. Occ.]

Calathea (§ Distichæ) subtilis (sp. nov.); caule brevissimo, vaginis aphyllis paucis ensiformibus obtecto; foliorum basalium vaginis laminam haud attingentibus sat latis, apice nonnunquam breviter auriculatis, margine hyalinis, glabris; petiolis gracilibus, glabris; articulo perbrevi, latere ad axin spectante villosulo; laminâ lanceolato-oblongâ, basi rotundatâ, apice breviter acuminatâ, tenuiter membranaceâ, glabrâ; scapo elongato, tenui, sub apice obscure pilosulo; inflorescentiâ folio cujus lamina foliorum basalium laminam sat simulat suffultâ, brevi; pedunculo gracili pilosulo incluso quam folium suffulciens $2\frac{1}{2}$-plo breviore; spicis abbreviatis ovatis; bracteis stricte distichis, late rotundato-ovatis, obtusissimis, sæpe cuspidulatis, deli-

catulis; sepalis late lineari-oblongis, obtusissimis, corollam fere duplo excedentibus; corollæ tubo brevi ac comparative lato, antherâ inappendiculatâ; ovario turbinato, glabro.

Hab. Crescit in sylvestribus ad ripas fl. Paraguay inter Santa Cruz et Villa Maria, ubi mens. Dec. floret. (N. 814.)

Rhizoma tenue, in sicco tortum, radices sat crassas emittens. Vaginæ caulem circa 1·0 cm. alt. occludentes, usque ad 9·0 cm. long., inferiores vero multo minores, obtusæ, obsolete puberulæ margine hyalinæ. Foliorum basalium vaginæ usque ad 16·0 cm. long., explanatæ 0·8 cm. lat., sursum coarctatæ, subtiliter nervosæ, tenuiter membranaceæ; petiolus supra vaginam 1·0–5·5 cm. long., facie superiore canaliculatus; articulus 0·1–0·2 cm. long., nec ultra 0·2 cm. diam.; lamina ad 15·0 cm. long., medio vix 3·5 cm. lat., imâ basi breviter villosula, costa media subtus eminente. Folii inflorescentiam suffulcientis petiolus 25·0 cm. long., 0·2 cm. diam., ejus vagina brevis, 2·5 cm. long., medio 0·6 cm. lat., utrinque angustata; petiolus vix 0·3 cm. long., articulo ter longior; lamina 14·0 cm. long., 4·0 cm. lat. Inflorescentia tota 5·4 cm. long., spica ipsa modo 2·0 cm., nutans. Flores et bracteæ albidæ, dilutissime virescentes. Bracteæ circa 1·1 cm. long. et lat.; sepala totidem longitudine. Corolla 0·6–0·7 cm. long.; tubus vix 0·2 cm. long. et 0·12 cm. lat. Petala lanceolata, obtusa, apice indurata, 0·5 cm. long. Anthera 0·2 cm. long.; connectivus apice incrassatus. Staminodium externum obovatum, emarginatum, erosum, 0·1 cm. long. Ovarium 0·15 cm. long.

Speciebus ab omnibus hujus sectionis hucusque cognitis abhorret, præter signa alia, spicis abbreviatis nec ultra 2·0 cm. longis. [Amazonia, Guiana, Columbia, Amer. Centr.]

CALATHEA (§ NUDISCAPÆ) PRÆCOX (sp. nov.); foliorum laminâ oblongo-oblanceolatâ, inæquilaterâ, basi sensim angustatâ, apice acuminatâ, supra fere omnino glabrâ, subtus minute puberulâ, usque vel pæne ad articulum vaginatâ; articulo brevi, facie superiore pubescente; scapo paullo præcoce, foliis multoties breviore, basi vaginis aphyllis ensiformibus plus minus elongatis cincto, sat valido, pubescente; spicâ oblongâ vel ovato-oblongâ, nonnunquam fere subsessili, paucibracteatâ; bracteis lanceolatis vel ovato-lanceolatis acuminatis, extus et dimidio superiore intus pubescenti-pilosulis; floribus longe exsertis; sepalis linearibus, obtusis; corollæ tubo sepalis plus quam 3-plo longiore; staminodio externo apice acutato, margine undulato; staminodio calloso late oblongo, obtusissimo, deorsum uno latere auriculato, obscure calloso; staminodio cucullato obtuso, auriculâ anguste oblongâ aucto; stamine fertili appendice petaloideâ aucto; antherâ anguste lineari-acutâ; stylo maxime incrassato, stigmate aratriformi.

Hab. In ripâ fl. Paraguay juxta Santa Cruz reperi mens. Oct. florentem. (N. 495.)

Tubera nunc subsphæroidea, nunc oblonga, viva pallide brunea, 1·0 cm. long. vel ultra, radices pluries parce ramosas emittentia. Foliorum vaginæ nunc elongatæ (usque ad 12·0 cm. long.), nunc perbreves (nec 3·0 cm.), explanatæ 0·3–1·0 cm. lat., in sicco bruneæ; articulus 0·2–0·4 cm. long., aliquando fere obsoletus, tenuis. Laminæ modicæ circa 12·0 cm. long., raro usque ad 20·0 cm.; costa media supra

impressa, subtus eminens. Vaginæ scapum cingentes superiores majores usque ad 7·0–10·0 cm. long. pertinentes, dorso sæpe villosulæ vel pubescentes. Scapus ad 5·5 cm. long., 0·15–0·2 cm. diam., ipsâ sub spicâ parum incrassatus. Spica absque floribus 3·0–4·0 cm. long., 2·0–3·0 cm. lat. Bracteæ modicæ 3·0 cm. long., et 1·2 cm. lat., vivæ dilute puniceæ. Flores albi. Sepala 1·13 cm. long. Corollæ tubus fere 4·0 cm. long., circa 0·1 cm. lat., apice paullulum ampliatus. Petala lanceolata, breviter acuminata, circa 1·5 cm. long. Staminodium externum 2·0 cm. long., vix 0·8 cm. lat. Staminodium callosum 1·7 cm. long. Staminodium cucullatum 0·5 cm. long., auriculâ 0·13 cm. long. Anthera 0·3 cm. long. Stigma 0·25 cm. long.

A *Calatheâ Mansonis*, Koern., differt, præter alia, spicis præcocibus, vaginis aphyllis, foliis multoties minoribus brevius ac inconspicue articulatis, bracteis angustioribus pubescenti-pilosulis, tubo corollæ longiore. [Amazonia, Guiana, Bolivia.]

Calathea (§ Scapifoliæ) humilis (sp. nov.); breviter caulescens, foliis caulinis basi a vaginis parvis aphyllis ensiformibus cinctis; petiolo gracili, anguste vaginato; articulo brevi, glabro; laminâ e basi rotundatâ levissime cordatâ, ovato-lanceolatâ, acuminatâ, fere omnino glabrâ; folii inflorescentiam suffulcientis vaginâ brevi satis latâ, ad articulum haud pertinente, puberulâ; petiolo ultra vaginam perbrevi; articulo puberulo; lamina ei folii caulini subsimili nisi minore; inflorescentiâ pedunculatâ, obovatâ; pedunculo erecto, tenui, puberulo; floribus breviter exsertis; bracteis nunc ovatis, nunc ovato- vel lanceolato- vel late lineari-oblongis, breviter acuminatis, puberulis; corollæ tubo sepalis nunc duplo, nunc paullo longiore; staminodio externo margine eroso quam cucullatum 3-plo longiore; ovario glabro.

Hab. Florescit ad Santa Cruz mens. Dec. (N. 796.)

Caulis rectus, 6·0 cm. long., 0·5 cm. diam., obsolete pruinosus; internodia pleraque 0·4–0·5 cm. long., passim radicifera, radicibus simplicibus orthotropicis vel plagiotropicis. Vaginæ aphyllæ vix ad 8·0 cm. long. et 0·5 cm. lat., obtusæ vel breviter acuminatæ, puberulæ. Folii caulini petiolus totus 8·5 cm. long., vaginâ 4·0 cm. long., tortâ; articulus 0·4 cm. long., lateraliter compressus; lamina 13·0 cm. long., juxta medium 4·0 cm. lat., tenuiter membranacea; costa media supra deorsum paullulum canaliculata, mox subplana, subtus eminens, basique ipsâ incrassata. Folii inflorescentiam suffulcientis vagina 0·23 cm. long., sursum gradatim coarctata, explanata vix 0·5 cm. lat.; petiolus ultra vaginam 0·25 cm. procurrit; articulus 0·3 cm. long.; lamina 9·0 cm. long. Pedunculus 2·0 cm. long., superne leviter amplificatus. Spica semel ramosa, 3·5 cm. long., 2·0 cm. lat. Bracteæ 2·0–vix 2·5 cm. long., 0·35–0·8 cm. lat., crebre nervosæ, membranaceæ, margine hyalinæ. Flores cyanei vel cærulei (meâ in schedulâ "flowers blue" scribebam). Sepala anguste linearia, longe acuminata, 0·8 cm. long. Corollæ tubus angustus 1·0–vix 1·5 cm. long., 0·1 cm. lat. Petala lanceolata, truncata, 0·5 cm. long. Staminodium externum 0·5 cm. long. Staminodium cucullatum 0·15 cm. long., breviter auriculatum. Anthera 0·2 cm. long., ejus connectivus ultra loculos breviter acuminatus. Stylus paullo incrassatus. Stigma 0·2 cm. long., clavatum.]

Mihi videtur species cum *Calatheâ Eichleri*, Petersen, conferenda, primo obtutu vero ab eâ secernenda habitu humili, foliis multo minoribus, petiolis longe evaginatis, necnon spicis et floribus multo minoribus. [Bras. Or.]

BROMELIACEÆ.

Bromelia sylvicola (sp. nov.); foliis super vaginam petiolum haud formantibus; inflorescentiâ abbreviatâ, anguste paniculatâ; bracteis primariis elongatis, bracteis II. ordinis sepalis subsimilibus, oblongis, obtusis, integris vel oblique erosis, obsolete albo-tomentellis, nonnunquam fere glabris; sepalis liberis, erectis, dorso carinatis, late lineari-oblongis, obtusis vel obtusissimis vel truncato-emarginatis, 0·6–1·2 cm. long.; petalis breviter connatis, obsolete puberulis; ovario dense albide floccoso-tomentoso.

Hab. Crescit in sylvâ ad ripas fl. Paraguay inter Santa Cruz et Diamantino, ubi mens. Oct. floret. (N. 489.)

Acaulescens. Folia basalia rosulata, ascendenti-patula, trimetralia, anguste linearia, superne valde ac longissime attenuata, deorsum vix 2·5 cm. lat., apicem versus ad 0·3 cm. angustata, margine aculeis parvis subdebilibus nec ultra 0·3 cm. long., antrorsum leviter curvatis, apice ipso deficientibus instructa, supra viridibus, subtus pallidis ibique passim minute albido-lepidotis. Folia interiora exterioribus sat similia nisi minora (mediocria circa 40·0 cm. long. et 0·7 cm. lat.), viva rubra, albido-lepidota, vaginis obovato-oblongis, sursum aculeigeris, extus albido-lepidotis, 3·0 cm. lat. fulta. Inflorescentiæ axis primarius albo-floccosus, circa 15·0 cm. long. et 0·8 cm. diam., foliis folia interiora simulantibus nisi iis minoribus deorsum laxiuscule instructus, superne ramulos breves florigeros albo- vel lutescenti-bruneo-floccosos gerens. Bracteæ primariæ ample vaginatæ, inferiores longilaminiferæ, superiores laminâ brevi coronatæ, summæ perbreviter laminiferæ neque usquam ad vaginas meras, ut in *B. reversacantha*, Mez, reductæ, præsertim summæ albo-floccosæ, debiliter aculeoligeræ. Bracteæ II. ordinis sepalis subsimiles, diversæ magnitudinis, nunc ovarium facile excedentes, nunc eo manifeste breviores, mediocres 1·0 cm. long., circa 0·35 cm. lat., papyraceæ, albæ. Flores brevissime pedicellati, pro genere parvi, ovario incluso vix 3·0 cm. attingentes. Sepala alba, papyracea, basi manifeste, sursum lævius albo-floccosa, deorsum paullulum imbricata, ceterum aperta, latâ basi inserta, inde vix angustata, parum curvata, circa 1·0 cm. long. Petala purpurea, oblongo-oblanceolata, obtusa, submembranacea, apice carnosula, 1·5–2·0 cm. long., 0·5 cm. lat., eligulata. Stamina petalis paullo breviora, filamenta deorsum in tubum 0·3 cm. alt. cum petalis connata. Antheræ 0·7 cm. long., anguste lineares, apice acutatæ, dorsifixæ. Ovarium anguste oblongum, trigonum, dense albo vel dilutissime bruneo-floccosum. Stylus medium antherarum attingens, triqueter, 0·1 cm. lat. Stigmatis lobi 0·23 cm. long., apice obtusi.

Bromeliæ reversacanthæ, Mez, arcte affinis, cujus flores, ut ex descriptione optimâ

patet, sat similes, stirps nostra equidem certe distincta, præsertim foliis nec reverse aculeatis interioribus in scapo positis, maxime elongatis nec parvis, bractearum primariarum formâ dispari, sepalorum et petalorum ambitu, antheris et stigmatis lobis longioribus. [Distrib. ?]

Ananas sativus, Schult. fil. in Roem. et Schult. Syst. Veg. vii. p. 1283. Var. microstachys, Mez.

Hab. Frequens in sylvis juxta Santa Cruz et alibi in provinciâ; floret menss. Oct.–Nov. (N. 412.)

Folia maxima biorgyalia, primâ ætate rubra, dein viridia. Scapi ultrametrales. Flores dilute purpurei. [Bras. Or., Goyaz ?]

Æchmea bromeliæfolia, Baker, ex Benth. et Hook. f. Gen. Pl. iii. p. 664.

Hab. Legi in sylvâ primævâ ad Santa Cruz mens. Sept. (N. 347.)

Folia maxima $\frac{2}{3}$-metralia, supra saturate viridia, subtus glauca. [Amer. Austr. Trop., Ins. Trinitatis.]

Tillandsia streptocarpa, Baker, in Journ. of Bot. 1887, p. 175.

Hab. Juxta Corumbá florebat mens. Jan. (N. 944.) [Bras. Or., Paraguaria.]

Tillandsia (§ Diaphoranthema) atrichoides (sp. nov.); caulibus cæspitosis, brevibus; foliis parvis, lineari-subulatis, basi breviter vaginantibus, nunc obtusiusculis, nunc acutis vel acuminatis, dense argenteo-lepidotis; pedunculis tenuibus, quam caules $2\frac{1}{2}$-plo longioribus; vaginis 4–5, parvis, argenteo-lepidotis, totâ longitudine occlusis; spicis 2–4-floris; floribus in rhachide brevi paullo undulatâ congestis; bracteis ovatis acutis, argenteo-lepidotis; sepalis late oblongis, acutis vel obtusis, bracteas paullo excedentibus; capsulâ cylindricâ, bracteas 3-plo superante.

Hab. Inveni super arborem ignotam vigentem inter Corumbá et Ladario, mens. Jan. (N. 1046.)

Caules circa 1·5 cm. long., foliis pluribus imbricantibus obtecti. Folia ad 2·5 cm. long., basi 0·13 cm. (vel ultra) lat., superne ad 0·03 cm. attenuata, triente inferiore (vel minus) concava, sursum subteretia, lepidibus parvis subfurfuraceis recurvis dense obsita. Vaginæ oblongo-lanceolatæ, obtusiusculæ, amplæ, quam folia minus lepidotæ. Pedunculi ad 4·0 cm. long., leviter undulati. Bracteæ 0·5 cm. long., in longitudinem nervosæ. Sepala bracteas circa 0·15–0·2 cm. superantia, polita, levissime lepidota, crebre nervosa. Petala ignota. Capsula vix 2·0 cm. long., valvis breviter mucronatis politis minutissime lepidotis.

T. loliacea, Mart. (*T. undulata*, Baker), cui maxime affinis, foliis majoribus (longioribus ac latioribus), spicis comparative laxifloris et plurifloris, bracteis rigidioribus, necnon capsulis longioribus et comparative angustioribus gaudet. [Bras. Or., Paraguaria.]

Vriesea Sanctæ-crucis (sp. nov.); foliis exterioribus circa 30 rosulatis, mediocribus, basi ovato-lanceolatis, sursum lineari-setaceis, acuminatis, arcte et minute lepidotis,

coriaceis; pedunculo foliis breviore, deorsum folia interiora elongata foliis exterioribus subconformia etsi basi angustiora, sursum in vaginas parvas amplas transeuntia, ferente; spicis pauci- vel plurifloris quam folia brevioribus, simplicibus vel subsimplicibus; bracteis lanceolato-ovatis, acuminatis; sepalis bracteam paullo superantibus; petalis calycem $\frac{2}{3}$-plo excedentibus, lingulatis; capsulâ bracteam $2\frac{1}{2}$-plo excedente.

Hab. Crescit super arborem ignotam juxta Santa Cruz, ubi flores et fructus simul tulit mens. Sept. (N. 361.)

Radices tenues, fibratæ, undulatæ, cinereæ, politæ, dense aggregatæ. Caules circa 3·0–4·0 cm. long. Foliorum exteriorum basis expansa circa 4·5 cm. long. et 2·0 cm. lat.; lamina circa 9·0–12·0 cm. long., fol. inferiorum 1·0–2·0 cm. long., fol. infimorum paucorum evanida vel fere evanida, sursum ad 0·1 vel 0·2 cm. angustata ibique curvata, folia omnia lepidibus brevibus argenteis densissime obtecta. Folia interiora inferiora usque ad 28·0 cm. long., 2·5–3·0 cm. lat., sursum ad 0·1–0·2 cm. coarctata, coriacea, basi ipsâ polita et quodammodo decoloria; vaginæ circa 2·0 cm. long., pergameæ, una cum foliis interioribus laxe imbricatæ. Pedunculi exempl. florigeri circa 12·0 cm. long., exempl. fructificantis 18·0 cm., punicei. Spica exempl. florigeri 4-flora, 4·5 cm. long., exempl. fructificantis pluriflora et 12·0 cm. long., leviter flexuosa, angulata, punicea. Flores subconferti. Bracteæ puniceæ, circa 3·0 cm. long., firmæ, nervosæ, minute lepidotæ. Sepala 2·0–2·5 cm. long., acuta, lepidota. Flores evanescentes cyanei vel purpureo-cyanei fuisse videbantur. Capsulæ 6·0–7·0 cm. long., valvis mucronato-acutatis firmis nervosis leviter curvatis. Semina 5·0 cm. long., apice capillis albis vix æquilongis instructa.

Speciem certe ad *Vrieseam corcovadensem*, Mez, spectantem et reverâ juxta illam intercalandam primo obtutu agnoscere potes, præter alia, foliis minoribus, conspicuius lepidotis, sursum majus attenuatis, et bracteis paullo minoribus, lepidotis nec politis. [Bras. Or.]

Hujus ordinis, sed quoad genus dubium, etsi forsitan *Quesneliæ* vel *Billbergiæ* species, exstat insequens :—*Bromeliacea arboricola*: foliis magnivaginatis, apice in petiolum non attenuatis, laminâ anguste lineari vel ensiformi, subito vel sensim acuminatâ, margine crebre ac breviter aculeolatâ, minute albido-lepidotâ, vaginâ haud exemptâ usque ad 50·0 cm. long. (foliorum exteriorum vero lamina multo minor); pedunculo gracili folia excedente, vaginis sparsis laxis ad 11·0 cm. long. (plerumque vero brevioribus) instructo; spicâ 5·0 cm. long.; bracteis infimis vaginis subsimilibus lineari-lanceolatis, bracteis superioribus multo minoribus; sepalis oblongis, obtusis, 1·0 cm. long., pubescentibus; ovario cylindrico, circa 1·0 cm. long., albo-pruinoso. Reliqua desunt.

Hab. Inveni juxta Santa Cruz, mens. Sept. floribus jam dilapsis. (N. 347 *a.*)

This is another myrmecophilous plant, and I was well stung while securing it. The ants live in the spaces between the wide loosely-imbricated leaf-sheaths, which latter they occasionally pierce.

IRIDEÆ.

Sphenostigma gramineum (sp. nov.); bulbo globoso tunicis tenuibus in sicco fusco-purpureo-nigris dense obtecto, vaginis paucis brevibus scariosis coronato; foliis radicalibus elongatis equitantibus anguste-linearibus, apice acuminatis; caule infra inflorescentiam 9·0–23·0 cm. long. erecto gracili, folio spatham suffulciente foliis radicalibus simili nisi plerumque latiore; inflorescentiâ abbreviatâ, angustâ, pauci-furcatâ, basi sæpe folio parvo (interdum foliis duobus), spathæ pari, instructâ; spathæ valvulis mediocribus, lanceolatis, breviter acuminatis, 1-floris; antheris lineari-oblongis quam filamenta a basi libera $\frac{1}{3}$-plo brevioribus; styli ramis obsphenoideis, emarginatis.

Hab. Viget juxta Santa Cruz, ubi reperi mens. Dec. (N. 732.)

Bulbus 1·0–1·3 cm. lat., vix totidem long., radices ex eo nascentes debiles, nec ultra 2·0 cm. long. Folia radicalia 16·0–35·0 cm. long., 0·2 cm. lat., anguste vaginata, vaginis tenuiter membranaceis, margine hyalinis, subtiliter purpureo-maculatis, explanatis 0·4 cm. lat., sursum angustatis. Folium inflorescentiam suffulciens non ultra 28·0 cm. long. (solemniter brevius), 0·4–0·5 cm. lat., basi margine hyalinum. Inflorescentia ad 3·0 cm. long. Valvulæ spathæ 2·0–3·0 cm. long., medio 0·7 cm. lat., margine hyalinæ. Pedicelli 0·7 cm. long., superne paullo ampliati. Flores circa 2·0 cm. diam., cyanei. Perianthii segmenta basi brevissime connata, externa oblonga, 1·4 cm. long., 0·45 cm. lat., duplo breviora, late linearia, basi (ex schedis meis) leviter luteo-cristata. Filamenta 0·2 cm., antheræ 0·3 cm. long. Stylus 0·75 cm. long., complanatus, rami 0·05 cm. long. Capsula nondum matura lineari-oblonga, basi coarctata, 0·6 cm. long., 0·13 cm. lat.

Forsitan accedens ad *S. geniculatum*, Klatt, plantam mihi non obviam, cujus folia longiora, caulis apice geniculatus, inflorescentia tribus foliis parvis suffulta, spatha 3-flora, pedicelli multo longiores, perianthium violaceum, necnon styli rami bifidi. [Matto Grosso.]

Zygella, Iridearum, e tribu Moræarum gen. nov. (Tab. XXXIV. figg. 1–13.)

Gen. char. :—Flores actinomorphi. Perianthii segmenta in tubum brevissimâ basi connata, unguiculata, segmenta interiora minora integra. Stamina segmentis exterioribus antiposita et juxta basin perianthii iisdem inserta; filamenta filiformia, libera, basi ipsâ dilatata; antheræ oblongæ, basi sagittatæ, connectivus excurrens laminis duabus coronatus. Ovarium 3-loculare, obtusum, scilicet haud in rostrum productum; ovula in loculis numerosa; stylus filamentis brevior, filiformis, haud procul a basi semel trichotomus vel bis dichotomus, rami 3, erecti, filiformes, staminibus antipositi; stigmata supra antheras lamelliformia, alte biloba. Capsula parva, elongato-ovoidea, apice truncata, breviter loculicide 3-valvis. Semina minuta, alâ sat magnâ instructa. Habitus *Calydoreæ*, Herb. Bulbus tunicatus. Folia radicalia pauca, angusta, equitantia, floralia 1–2 minora. Spathæ paucæ; valvulæ angustæ, inferior quam superior brevior, sessiles vel

pedunculatæ. Flores parvi, intra spatham solitarii vel bini, pedicellati. Capsula e spathâ exserta.

Genus memoratu dignum, habitu ad *Calydoream* accedens, ab eâ vero abhorret, præter alia, styli ramis longe disparibus (itaque generibus ab omnibus e tribu *Sisyrinchiearum* stylis staminibus antipositis). Ob antherarum appendices singulares plane diversa videtur ab omnibus *Moræarum*, quarum habitus insuper plus minus alienus.

Zygella graminea (sp. nov.); bulbo subgloboso, parvo, tunicis bruneis in collum supra bulbum longiuscule productum dense obtecto; foliis radicalibus anguste linearibus, acuminatis, satis ample vaginatis, nunc elongatis, nunc brevibus, nonnunquam ad vaginam meram fere vel omnino reductis; caule breviusculo vel sat elato, gracili; foliis floralibus majoribus solemniter florem infimum suffulcientibus foliis radicalibus subsimilibus; pedunculis gracilibus; spatharum valvulis lanceolatis, valvulâ inferiore acutâ, superiore pedicello arcte circumvoluto truncatâ; perianthii segmentis spathulari-obovatis obtusis, antheris filamentis æquilongis; stylo filamentis fere 2-plo breviore, ramis sursum ampliatis.

Hab. Crescit ad Santa Cruz, ubi mens. Nov. florescit. (N. 733.)

Bulbus circa 1·0 cm. long. et lat., basi parce radicifera, radices debiles, simplices, rarius breviter ramosæ; collum 1·0–1·5 cm. long. Folia radicalia majora 8·0–12·0 cm. long., 0·1–0·15 cm. lat., vaginæ ad 0·3 cm. lat., sursum angustatæ, scariosæ. Caulis infra folia floralia ad 24·0 cm. alt., modicus circa 16·0 cm., erectus, ad 0·1 cm. diam., apice leviter geniculatus. Folia floralia 5·0–9·0 cm. long., ad 0·2 cm. lat., basi sat ample vaginata. Pedunculi usque ad 9·0 cm. long. (plerique vero breviores), erecti. Spathæ valvula inferior circa 1·5 cm., superior circa 2·5 cm. long. Pedicelli ad 3·0 cm. long. Perianthii segmenta nunc cyanea, nunc cærulea, basi dilute lutescenti-viridia, ibidem purpureo-maculata, ad 0·1 cm. connata; segmenta exteriora 1·5 cm., interiora 1·2 cm. long. Filamenta 0·25 cm. long. Anthera tota 0·4 cm. long. Pollinis grana globosa, tuberculata. Stylus vix 0·2 cm. long., imâ basi leviter incrassatus, rami quam ipse 2–2½-plo longiores; lamellæ 0·15 cm. long. Capsula ad 0·5 cm., extra spatham exserta, 0·5 cm. long., vix 0·3 cm. lat., ejus valvæ obtusæ, modo 0·1 cm. long. Semina tota 0·075 cm. long. ovoidea, brunea, alâ quam corpus ipsum seminis 2½-plo longiore appendiculata.

This is a curious genus, apparently not very closely allied to any other. In habit and floral structure it is unlike most genera of *Moræeæ*, coming closest probably, in these respects, to *Alophia*. The habit is that of the subtribe Cipureæ of *Sisyrinchieæ*, the distinctively American portion of the order, so much so, indeed, that the plant might easily be mistaken for a species of one of that subtribe's genera until dissection should reveal the difference. From all these genera *Zygella* is at once distinguished by its curious stamens, and, among them, *Nemastylis* alone has divided style-arms, but style-arms which are subulate and quite unlike the lamelliform organs of *Zygella*. There can, I think, be no reason to doubt our plant's claim as being an example of a new genus, which seems to connect in some measure the two tribes *Moræeæ* and *Sisyrinchieæ*, since it unites in itself the anti-staminal style-arms of the former and the habit of the latter tribe—hence its proposed name, from ζυγόω, to join together.

In the figures of Tab. XXXIV. the anthers are shown as quite free from the style-arms, and I believe this to be the case with fresh flowers, as I distinctly remember collecting some Irideous flowers with curious free staminal appendages. In the dried flower, however, the anthers are each of them attached to its respective style by means of its two appendages, which get squeezed against the two laminæ—one against each lamella—so that it is only by very careful dissection that the appendages can be isolated: fig. 4 shows well the relation between anther and style-arm in a dried flower.

Zygella is somewhat peculiar in the structure of its leaf, inasmuch as, contrary to the rule in Iridaceæ, the vascular bundles are not accompanied by sclerenchyme. Sclerenchyme is found only at the four edges of the leaf (Tab. XXXIV. fig. 13), and there is an interval between each of the masses of sclerenchyme and the nearest vascular bundle, an interval occupied by resin-sacs. The epidermal cells are large and very thick-walled, the inner wall also being greatly strengthened.

HYPOXIDEÆ.

Curculigo ensifolia, Baker, in Journ. Linn. Soc., Bot. xvii. p. 124.

Hab. Santa Cruz, Nov. (N. 735.) [Amer. Austr. Trop., Ind. Occ.]

AMARYLLIDEÆ.

Zephyranthes (§ Euzephyranthes) lactea (sp. nov.); bulbo ovoideo, tunicis fusco-bruneis dense obtecto, tunicis ad 2·0 cm. long. ultra bulbum in collum eminentibus; foliis radicalibus elongatis, anguste linearibus, obtusis, tempore florendi prolatis; scapo gracili, raro deorsum ampliato; spathâ oblongâ 2·0–3·0 cm. long., more generis apice bifidâ; pedunculo spatham nunc æquante, nunc quam ea longiore vel breviore, gracili; floribus mediocribus; perianthii tubo brevissimo, lobis ovato-lanceolatis, breviter acuminatis, inter se arcte applicatis, et ita tubum superne leviter ac gradatim ad 0·5 cm. ampliatum mentientibus; staminibus juxta basin tubi insertis, filamentis complanatis tribus; perianthii segmentis interioribus antipositis; longioribus æquilongis, tribus brevioribus æquilongis; stigmate inæqualiter trifido.

Hab. Crescit in locis apertis ad Jangada, mens. Sept. florens. (N. 283.)

Bulbus 1·5 cm. diam., 1·0 cm. long., collum solemniter 1·0–2·0 cm. long. et 0·7–0·9 cm. diam. Folia radicalia 8·0–14·0 cm. long., nonnunquam basi attenuata, 0·2–0·3 cm. lat. Scapus usque ad spatham 6·0–16·0 cm. long., sub spathâ levissime ampliatus ibique floribus dilapsis incrassatus. Spatha usque ad 3·0 cm. long., sublaxa, circa ad 0·5 cm. bifida. Pedunculus 2·0–5·0 cm. long., tenuis vel satis incrassatus. Flores albi. Flos totus 4·5 cm. long., vix 3·0 cm. diam. Perianthii tubus 0·4 cm. long., annulo squamarum parvarum laceratarum auctus. Antheræ anguste lineares, 1·2 cm. long. Filamenta breviora 0·5 cm. long., longiora 2·0 cm. Stylus 1·8–2·1 cm. long., rami 0·15 cm. long.

A *Z. cearensi*, Baker, abhorret floribus majoribus albis, perianthii tubo squamato, staminibus multo majoribus inæquialtis, etc. [Bras. Or., Goyaz.]

HIPPEASTRUM SOLANDRIFLORUM, Herb. App. p. 31.

Hab. Reperi ad Santa Cruz mens. Nov. (N. 658.) [Amer. Austr. Trop.]

DIOSCOREÆ.

DIOSCOREA, sp. Volubilis, glabra, caule subtetragono, 0·15 cm. diam.; foliis petiolatis, petiolis 6·5–7·5 cm. long. fultis, profunde cordatis, breviter cuspidato-acuminatis, 7·0–10·0 cm. long., basi 7·0–10·0 cm. lat., tenuiter membranaceis, supra viridibus, subtus vivis lepide purpureis, 7-nervibus, nervis externis aperte arcuatis, nervo posteriore mox bifurco, nervis internis oblique-ascendentibus in acumen 0·5–0·7 cm. long. excurrentibus. Reliqua desunt.

Hab. Crescit juxta Corumbá. (N. 982 *a.*)

DIOSCOREÆ (§ HELMIÆ) species indeterminabilis: caule volubili, subtetragono, glabro; foliis petiolis 4-angularibus, utrinque leviter incrassatis ibique subobsolete pruinosis, 4·0–5·0 cm. long. insidentibus; laminis cordatis, lateribus approximatis, acutis, leviter undulatis, 7·5–9·0 cm. long., basi 7·5 cm. lat., coriaceo-membranaceis, utrinque viridibus, 7-nervibus, nervo postico mox trifurcato, nervibus lateralibus anticis erecto-ascendentibus, posticis late arcuatis; capsulis oblongis, loculis complanatis, coriaceo-membranaceis, in rhachide pendente debili 10·0–15·0 cm. long. dispositis, 1·6–1·9 cm. long., 1·0 cm. lat., glabris, in sicco lutescenti- vel bruneo-nitidis, nonnunquam leucophæis. Reliqua desunt.

Hab. Crescit ad Corumbá, mens. Jan. fructificans. (N. 1088.)

SMILACEÆ.

SMILAX SYRINGOIDES, Griseb. in Mart. Fl. Bras. iii. pars i. p. 11.

Hab. Santa Cruz, ubi fructificat mens. Oct. (N. 362.)

Baccæ subglobosæ, circa 0·7 cm. diam., vivæ luteæ, siccæ purpureo-nigricantes. [Bras. Or.]

SMILAX BENTHAMIANA, A. DC. Monog. Phan. i. p. 114.

Hab. Reperi ad Jangada mens. Sept. florentem. (N. 277.) [Amazonia.]

SMILAX (§ EUSMILAX) MEDICINALIS (sp. nov.); ramis gracilibus, brevibus, nitidis, parce spinosis; foliis brevipetiolatis, ovato-lanceolatis, raro lanceolatis, basi plus minus rotundatis, apice breviter mucronulatis; petiolis fere vel usque ad $\frac{1}{2}$ vaginatis; pedunculis masc. petiolos superantibus erectis; umbellis plurifloris; receptaculo globoso; floribus parvis, petalis quam sepala angustioribus, antheris elongatis, oblongis, acutis; fl. fem. ignotis.

Hab. Crescit in sepibus ad Santa Cruz, ubi mens. Sept. floret (N. 305.)

Rami parum undulati, divergentes, obtuse polygoni, juveniles fere quadrangulares, striatuli, spinis fere rectis 0·3–0·5 cm. long. lateraliter compressis obsiti. Petioli

0·5–1·0 cm. long., nunc valide, nunc debiliter cirrhiferi, nunc cirrhis nascentibus aculeatis vel lenibus instructi, raro calvi, apicem versus paullo incrassati, infra apicem rumpentes. Laminæ juniores 5·0–6·0 cm. et vetustiores 7·0–9·5 cm. long., 2·0–4·5 cm. lat., margine cartilagineo plus minus undulato, breviter ac parce spinuloso vel espinoso, coriaceæ, a basi 7-nerviæ; nervis in petiolum decurrentibus, nervo medio dorso nonnunquam spinâ brevi aucto, nervulis maxime eminentibus. Pedunculi masc. omnes petiolos superantes, 1·0–2·0 cm. long., tenues. Umbellæ pleræque circa 25–40-floræ. Receptaculum 0·4 cm. lat., bracteolis ovatis acuminatis instructum. Pedicelli circa 1·0 cm. long., gracillimi. Alabastra parva, ovoidea, vix ultra 0·1 cm. long. Flores virescentes. Sepala oblonga, obtusiuscula, 0·12 cm. long., cum petalis oblongis paullo angustioribus patentia. Stamina sepalis $\frac{1}{3}$ breviora. Antheræ oblongæ, acutatæ, filamentis fere 3-plo longiores.

Species certe cum *Smilace polyanthâ*, Griseb., comparanda, cujus folia mimetica, sed longius mucronulata nec unquam margine vel inferne spinosa. Rami vero plantæ nostræ spinosi, pedunculi graciles nec complanati, florum minorum sepala et petala disparia, et antheræ oblongæ acutæ (nec ellipticæ). [Amazonia.]

Vicani plantam hanc in usu habebant ut sanguinim puriorem reddat.

LILIACEÆ.

Herreria Salsaparilha, Mart. Reise Bras. ii. p. 545.

Hab. Legi ad Santa Cruz et alibi in viciniâ mens. Oct.–Dec. floribus et fructibus orbam. (N. 465.) [Bras. Or.]

Stirps apud incolas ad usum vice *Smilacis* speciebus variis.

PONTEDERIACEÆ.

Eichhornea azurea, Kunth, Enum. iv. p. 129.

Hab. Frequens et gregaria in fl. Paraguay, San Lorenço?, Cuyabá, et dos Bugres. Nom. vernac. *Camalote*. (N. 842.) [Amer. Trop., Paraguaria.]

MAYACEÆ.

Mayaca Sellowiana, Kunth, Enum. iv. p. 32.

Hab. Incolit paludes in cacumine montium Serra da Chapada juxta Santa Anna da Chapada, ubi mens. Aug. floret. (N. 113.) [Bras. Or., Amazonia, Paraguaria.]

ALISMACEÆ.

Echinodorus paniculatus, Micheli, in DC. Monog. Phan. iii. p. 51.

Hab. Reperi prope Corumbá mens. Jan. florentem. (N. 969.) [Amer. Trop. Merid., Paraguaria.]

COMMELYNACEÆ.

(Determ. cl. C. B. CLARKE.)

COMMELINA NUDIFLORA, Linn. Sp. Pl. ed. I. p. 4.
Hab. Floret ed Santa Cruz mens. Nov. (N. 545.) [Reg. calid. totius orbis.]

COMMELINA SCHOMBURGKIANA, Klotzsch, in Schomb. Faun. et Fl. Guiana, p. 1064.
Hab. Santa Cruz ; mens. Oct. floret. (N. 542.) [Guiana.]

COMMELINA VIRGINICA, Linn. Sp. Pl. ed. II. p. 61.
Hab. Prope Corumbá et ad Jangada. (Nn. 282, 854 *a*.) [Amer. Trop. et Subtrop.]

ANEILEMA SEMIFOLIATUM, C. B. Clarke ; fere glabra, tuberibus anguste oblongis, caule stricto erecto, nodis distantibus ; foliis omnibus abbreviatis, sub-bracteiformibus ; pedicellis 1–3-nis ex utrâquâque bracteâ unifloris, ceteroquin ut *A. Schomburgkianum*, Kunth.
Hab. Crescit ad Santa Cruz, ubi mens. Oct. floret. (N. 541.)

Tubera 0·4 cm. diam., circa ad 2·0 cm. long., parce radicifera. Culmi 30·0–40·0 cm. long., lineâ puberulâ instructi, deorsum vix ad 0·4 cm. diam. Internodia inferiora ad 10·0 cm. long., modica circa 7·0 cm. Folia inferiora usque ad 3·5 cm. long., 1·5 cm. lat., obtusa, marginibus basi fere connatis ; superiora vaginantia (sæpissime pedicellos amplectentia), apice spathaceo-fissa, in altero latere breviter lanceolata aut fere ad vaginas abbreviata. Pedicelli vaginam duplo excedentes vel breviter exserti, rarius subinclusi. Sepala 0·6 cm. long., oblongo-lanceolata, viridia. Petala vix sepalis æquilonga, purpurea. Stamina 3 fertilia, 3 sterilia, filamentis omnibus dense barbatis. Capsula 0·65 cm. long., 0·3 cm. lat., apice acuminata. Semina uniseriata. [Amazonia, Guiana.]

PALMÆ.

DESMONCUS, sp. nov. ; folii segmentis pluribus per acervos 1–3 approximatis vel subdistantibus, basi subplanis, oblanceolatis, acutis vel obtusiusculis, nervo medio eminente et utrinque spinis longiusculis debilibus 1–4 passim armato ; flagello valido, deorsum aculeis elongatis, iis rhachidi insidentibus similibus, instructo, spinarum juga 6 e basi incrassata triquetro-complanata ferente. Reliqua desunt.
Hab. Ad Santa Cruz satis abundat. (N. 504 *a*.) *Urubamba* vicanorum.

Caudex scandens, aculeis rectis longis validis atratis instructus. Folia saltem 60·0 cm. long., incluso flagello circa 35·0 cm. attingente. Rhachis crassitie pennæ cervinæ, in sicco leviter trigona, aculeis rectis tenuibus acuminatis ad 3·5 cm. long. obsita. Segmenta admodum inæqualia, 7·5–13·0 cm. long., nunc opposita vel subopposita, nunc distantia, segmenta terminalia reliquis majora, aculei segmentorum plerique 0·9–1·4 cm. long., debiles, acuminati, atrati. Flagellum subtriquetrum, 0·13 cm.

diam., spinarum jugum proximum fere 0·3 cm. lat., vix 3·5 cm. long., juga reliqua vix 2·2 cm. attingentia, jugum summum 1·0 cm. long.

Forsitan juxta *Desmoncum rudentum*, Mart., intercalandus, multis signis vero ab eo abhorret.

Astrocaryum ? sp. Acaulescens, foliorum rhachide longe ac debiliter spinescenti, spinis ad 6·0 cm. long., atratis; foliis apice integris ibique ad 14·0 cm. bilobis et in nervis paginæ superioris appresse spinuliferis, segmentis pluribus per acervos 1–2 subdistantes anguste linearibus, breviter acuminatis, nervo medio sat eminente, subtus minute albido-lepidotis, paginâ superiore raro spiniferis, margine revoluto, spinis vix unquam ultra 1·0 cm. long. atratis instructis.

Hab. Frequens ad Santa Cruz. (N. 504 *b*.)

Cocos, sp. Caudice gracili, humili, paullo ultrametrali; foliis basi rectis, dein patulis, metralibus, segmentis anguste linearibus, acuminatis, pæne usque ad 30·0 cm. long., 0·45–0·7 cm. lat., per acervos solemniter 3–4 approximatis; petiolo ancipite, facie superiore plano, dorso elevato, in medio 1·0 cm. lat.; costâ superne leviter ac gradatim angustatâ, præsertim sursum sordide albo-lepidotâ, spadice pedunculatâ fructiferâ 20·0 cm. long.; rhachide dorsiventrali petiolum subæquante, ramos secundos densifructiferos, rigidos, anfractos sustinente; drupâ oblongâ, 4·0 cm. long., 1·7 cm. lat., apice obtusâ. Reliqua desunt.

Hab. Reperi ad ripas fl. dos Bugres mens. Oct. (N. 427.)

Diplothemium jangadense (sp. nov.) (Tab. XXXVI.); foliis patulis, paucis, segmentis per acervos 1–3 distantes rhachidi late canaliculatæ subopposite vel distanter insertis, linearibus, longe ac gradatim acuminatis, glaucescentibus; spathâ ovato-lanceolatâ, sursum obtuse angustatâ; spadice longissime pedunculatâ, parte florigerâ quam spatha saltem $\frac{1}{4}$-plo breviore, anguste fusiformi, deorsum latiore, et androgynâ sursum tenuiore et masculâ parte androgynâ quam pars mascula $\frac{1}{2}$- fere 2-plo breviore; floribus evolutis utriusque sexûs æquilongis, saltem iis e parte androgynâ ortis, florum fem. seplis late linearibus vel lineari-spathulatis, in margine breviter albido-papulosis; staminibus 11 liberis, germinodio subnullo; drupâ ignotâ.

Hab. In sylvestribus ad Jangada, ubi spadices profert mens. Sept. (N. 269.)

Caudex 0. Folia ultra sesquimetralia petiolis validis 70·0 cm. long., 0·8 cm. lat., supra late canaliculatis, dorso rotundatis, glaucescentibus fulta; segmenta, saltem inferiora, 35·0 cm. long., 0·4–0·7 cm. lat., nonnunquam vero minora et angustiora (22·0 cm. long., modo 0·2 cm. lat.), apice quam maxime attenuata, margine cartilaginea, subtiliter nervosa, subtus pallidiora ibique pruinoso-glaucescentia. Spadix usque ad 40·0 cm. alt., 0·4 cm. diam.; pedunculus obtuse anceps, sursum ad 0·65 cm. diam. incrassatus, pars florigera ad 0·8 cm. long., basi circa 0·7 cm. diam., superne gradatim acuminata. Spatha crassa, rigida, crebre nervosa, extus pallide virescens, intus castanea. Flores evoluti 0·5 cm. long., florum fem. sepala et petala 0·45–0·5 cm. long., sursum inflexa, hæc late linearia, obtusa, valde incrassata, eximie nervosa. Antheræ ad 0·3 cm. long., oblongæ, rectæ vel incurvæ; florum omnium a me scrutatorum 11, filamenta

0·13 cm. long., basi incrassata, omnino libera. Florum fem. sepala et petala 0·5 cm. long., late ovata, hæc leviter triloba. Sepala florum utrisuque sexûs margine papulis albis, more *Diplothemii leucocalycis*, Drude, aliquatenus munita.

Sine dubio ad *D. leucocalycem*, Drude, spectat, plantam tantummodo icone et descriptione optimâ auctoris laudati mihi cognitam; stirps nostra vero gaudet foliorum segmentis multo longioribus, longe acuminatis, et comparative angustioribus, florum masc. 11-androrum sepalis late linearibus vel lineari-spathulatis (nec rotundato-acutis), ad marginem brevius papulosis, eorundem florum germinodio subnullo, etc. [Bras. Or.]

Fruits of the following Palms were also obtained and brought down:—

I. The *Boriti* or *Buruty* Palm, in all probability *Mauritia vinifera*, Mart. A useful Palm for building purposes. The nut yields a good oil.

II. The *Guacory* Palm, *Attalea* sp., near *A. Princeps*, Mart., but differing somewhat in shape and size of its drupes, which are nearly 8 cm. long. by 4 broad. The fruit differs from all described by Drude, and belongs in all probability to a new species. The nut is edible and contains a good oil. The species placed next to *A. Princeps* by Drude, viz. *A. phalerata*, Mart., is said by Weddell to have a wide distribution in Matto Grosso, and one of its names, according to the same authority, is *Acurí*, evidently the same word as *Guacory*; but the fruits of *A. phalerata* are different from those of the present plant.

III. The *Bocaúba*, *Bocaúva*, or *Mocaúva* Palm. Probably *Acrocomia sclerocarpa*, Mart., but with some very slight differences in the fruit. Edible sarcocarp and nut, the latter tasting like a Brazil nut and with much oil. One of the native names for *A. sclerocarpa* is Macaúba, evidently the same word as the above.

IV. The *Tocúm* Palm. Probably *Astrocaryum Tucuma*, Mart., but with slightly different drupe. Drupes edible and pleasant when quite ripe, though the flesh is stringy. All the above fruit in November and December.

V. *Euterpe precatoria*, Mart. (N. 427 *a*.)

AROIDEÆ.

CALADIUM (§ nova, CALAMANDRA) HETEROTYPICUM (sp. nov.) (Tab. XXXV. fig. 13); foliorum petiolo folia subæquante, elongato, incrassato; laminâ e basi truncatâ vel truncato-rotundatâ, lanceolatâ vel lineari-lanceolatâ, longe ac sensim acuminatâ; costis secundariis utrinque 4–6, erecto-ascendentibus, juxta marginem aperte arcuatis et intra marginem arcte approximatis; nervis collectivis 2–3 e basi nascentibus; pedunculo petiolum subæquante; spathæ dilute viridis tubo amplo sursum attenuato, laminâ oblongâ, obtusiusculâ; spadice spathæ æquilongâ vel subæquilongâ, breviter stipitatâ, inferne dorso spathæ adnatâ, prorsus lacteâ, ad $\frac{1}{5}$ totius longitudinis florum fem. gerente parte masculâ parti sterili subæquilongâ; ovario biloculari, ovulis quovis in loculo 3, fere e medio dissepimento ortis, omnibus arrectis.

Hab. Reperi ad Santa Cruz mens. Nov. florescentem. (N. 691.)

Tuber parvum, circa 2·0 cm. diam. Petioli 16·0–45·0 cm. long., basi longe vaginantes, lamina usque ad 36·0 cm. long., 3·5–10·0 cm. lat. (modica 6·0–7·0 cm.). Pedunculus

30·0–40·0 cm. long. Spatha ad 12·0 cm. long., basi 1·5–2·0 cm. diam., lamina expansa 2·0 cm. lat. Inflorescentia feminea 2·5 cm. long., 1·0 cm. diam., dimidium inferius dorso spathæ adnatum; mascula sterilis 4·0 cm. long., attenuata; mascula fertilis 4·0 cm. long., 0·5 cm. diam. Synandria 4-andria, 0·1 cm. diam.

The only peculiarity about this plant is in its placentation; instead of several ovules attached in series all the way up the dissepiment, the arrangement characteristic of *Caladium*, we here find only three ovules springing almost from the same point near the middle of the dissepiment. I cannot help thinking that, as Aroideous genera now go, this would by some be considered sufficient warrant for describing our plant as a new genus; but I refrain from so doing in deference to the opinion of Mr. N. E. Brown, who kindly looked at the specimens, and who on matters concerning this group is, it need scarcely be said, our best authority.

APHYLLARUM, Aroidearum (Colocasiearum sensu Benth. et Hook. f.) gen. nov. (Tab. XXXV. figg. 1–12.)

Spadices inappendiculatæ, deorsum flores fem., sursum flores masc. proferentes, pars intermedia floribus masculis imperfectis elongatis instructa. Perianthium 0. Fl. masc. synandrium incrassatum 3–4-andrum, ambitu pentagonum vel hexagonum; antherarum loculi contigui, paralleli, inæquilongi, rimis apicalibus dehiscentes. Fl. fem. ovarium oblongum, obtusum, bilateraliter compressum, 2-loculare, stigmate sessili late truncato incrassato obscure lobato coronatum; ovulum quovis in loculo unicum, pæne e basi dissepimenti ortum, erectum, funiculo brevi insidens anatropum raphe dorsali et micropyle infera. Pedunculi elati, præcoces, solitarii, e latere tuberis fere nudi. Spathæ tubus amplus, convolutus, fauce parum coarctatus; lamina erecta, subcucullata. Spadix a spathâ superata, breviter stipitata, dorso usque ad medium partis femineæ spathæ adnata, clavata, pars mascula parti femineæ pæne æquicrassa. Synandria dense aggregata. Ovaria omnino libera.

Genus cum *Caladio*, Vent., et *Scapispathâ*, Brongn., componenda, ab illo distans habitu et ovarii loculis monovulatis, ab hâc imperfecte cognitâ saltem ovario biloculari, loculis monovulatis, et stigmate lato truncato nec parvo et capitato.

APHYLLARUM TUBEROSUM (sp. nov.); bulbo 3·0 cm. long., 2·0 cm. diam., basi parce radicifero; pedunculo incrassato, ac reverâ in sicco fere ad 0·5 cm. compresso, imâ basi squamis parvis fragilibus bruneis instructo, ceterum nudo, circa 40·0 cm. alt.; foliis ignotis; spathâ 6·0–7·0 cm. long.; tubo 1·7 cm. diam., virescente; laminâ vix usque ad 4·0 cm. long., apice acutiusculâ, lacteâ, explanatâ vix 3·0 cm. lat.; spadicis lactei stipite 0·3 cm. long.; parte femineâ 1·0 cm., parte synandrodigerâ 1·8 cm., parte synandrigerâ 2·0 cm. long., 0·5 cm. diam.; synandrodiis aggregatis, 0·15 cm. long., 0·15–0·2 cm. diam.; pollinis granis granulis cassis intermixtis; ovario ancipite, 0·1 cm. long., 0·075 cm. lat.; stigmate 0·1 cm. diam., quam ovarium plus quam duplo brevius.

Hab. Crescit juxta Santa Cruz, mens. Nov. spadices ostendens. (N. 678.)

The scape, of which a diagrammatic section is shown at fig. 6 of the above Plate, consists of fundamental tissue traversed by vascular bundles, which are accompanied, as

usual in Aroideæ, by latex-tubes. At intervals round the stem are seen masses of sclerenchyme, each mass upon the outer side of a peripheral vascular bundle, and near them run other latex-tubes. The epidermal cells contain resin.

A circle of vascular bundles immersed in delicate parenchyme is found at the centre of the synandrium (fig. 6); outside this a considerable part of the tissue consists of resin-sacs, with scattered sclerenchyme elements. The latter are spindle-shaped and contain each a bundle of raphides, and inasmuch as they appear to be in small cavities of the surrounding tissue, they are probably of the nature of intercellular hairs. I find it impossible, however, to speak decidedly on this point, as the supposed cavities may really be the effect of drying. Latex-tubes accompany the vascular bundles. All the largest synandria have eight anther-cells, which are of normal structure. Many of the pollen-grains soon become effete, and in this state may sometimes be seen closely applied to a fertile grain (fig. 7); the fact that the effete grains are at length completely emptied of their fovilla leads one to suspect that they are made use of by their successful fellows, but in order to decide this point properly preserved material is necessary.

PHILODENDRON, sp. Foliorum lamina latissime reniformi-cordata, margine repanda, vix lobata Reliqua desunt.

Hab. Corumbá. (N. 977.)

Remarkable for the extremely wide cordation of the leaf. I have seen nothing like this in our herbaria, and it is probably a new species.

TACCARUM WEDDELLIANUM ?, Brongn. ex Schott, Prod. Aroid. p. 336.

Hab. Corumbá. (N. 977 *a.*)

Folia tantummodo suppetebant. [Matto Grosso.]

MONSTERA BROWNII (sp. nov.); petiolorum vaginis latis, fere geniculum attingentibus; laminâ a basi rotundatâ sursum angustatâ, ovata acutâ vel breviter acuminatâ, nunc foraminibus carente, nunc juxta costam mediam pauciforaminatâ foraminibus inter costas secundarias solitariis; costis secundariis utrinque 9–12 costæ mediæ arcuatim insertis; pedunculo quam spatha longiore; spathâ crassâ, brevi, late ovatâ obtusâ; spadice cylindricâ, satis incrassatâ, spathæ æquilongâ; ovario stylo truncato concavo coronato; baccis compresso-ovoideis, monospermis, albis.

Hab. Crescit in sylvâ primævâ juxta Santa Cruz, mens. Sept. florens. (N. 351.)

Caulis scandens, 2·0 cm. diam., radices bruneas copiose emittens. Foliorum petioli ultra 30·0 cm. long. Vaginæ explanatæ 2·0 cm. lat.; petiolus inter vaginam et geniculum 1·0–4·0 cm. long.; geniculus 1·0 cm. lat. Lamina ad 37·0 cm. long., 19·0 cm. lat.; foramina anguste elliptica, ad 3·5 cm. long. Pedunculus ad 16·0 cm. long., vix 0·1 cm. diam. Spatha 7·0–8·0 cm. long., explanata 5·5 cm. lat. Spadix ad 8·0 cm. long., 2·5 cm. crass., prorsus alba. Staminum filamenta spathulata, 0·35–0·45 cm. long., 0·1 cm. lat. Ovarium lateraliter compressum 0·3 cm. long. Stylus 0·25 cm. diam. Baccæ 0·65 cm. long., 0·55 cm. lat., stylo persistente 0·3 cm. long. instructæ. Semina oblique subreniformia, lateraliter compressa, marginibus obtusis, 0·5 cm. long., 0·75 cm. lat.

Juxta *Monsteram Adansoni*, Schott (quæ eadem ac *M. pertusa*, De Vriese), intercalanda, abhorret vero, præter signa alia, costis secundariis magis obliquis, spathâ latâ spadicem subæquante, filamentis longioribus spathulatis nec linearibus. [Amer. Austr. Trop. et Centr.; Ind. Occ.]

Named in honour of Mr. N. E. Brown, of the Kew Herbarium, whose services to Botany, in the shape of numerous drawings, notes, and carefully prepared garden specimens of Aroideæ, were they only better known, would be more highly appreciated.

Anthurium gracile, Lindl. Bot. Reg. sub t. 1635.

Hab. Incolit sylvam primævam inter Santa Cruz et Tapirapuan, ubi florescit mens. Sept. (N. 393.) [Amazonia, Guiana, Nov. Granat., Amer. Centr., Ins. Trinitatis.]

Anthurium (§ Dactylophyllium) sylvestre (sp. nov.); petiolo elongato, subterete, leviter sulcato, geniculo subbrevi, laminâ subcoriaceâ 7-sectâ, segmentis tribus exterioribus in phalangem connatis, intimo solummodo libero, oblanceolatis, acuminatis, segmento postico postice auriculato, ceterum, præter marginem plus minus repandum, integris; pedunculo petiolo $\frac{1}{3}$-plo breviore; spathâ lanceolato-lineolari-obtusâ; spadice spathâ haud duplo longiore, gracili, superne gradatim attenuatâ.

Hab. Crescit in sylvâ primævâ inter Santa Cruz et Tapirapuan, mens. Sept. spadices ostendens. (N. 392.)

Petiolus 42·0 cm. long., 0·3 cm. diam., vaginâ brevi nec ultra 3·0 cm. long. instructus, basi incrassatus; laminæ segmenta 16·0 cm. long., 3·5–4·5 cm. lat.; costæ secundariæ utrinque circa 5, erecto-arcuatæ, dein margini parallele-cursantes, costæ pag. sup. vix eminentes, pag. inf. arcte reticulatæ. Pedunculus 28·0 cm. long., deorsum 0·4 cm. diam., sursum ad 0·2 cm. attenuatus. Spatha 8·0 cm. long., medio 2·0 cm. lat., purpurea. Spadix 13·5 cm. long., basi 0·6 cm. crass., viridis. Flores 0·3 cm. long.

A. Martini, Schott, proxima, cujus laminæ segmenta duo (nec tria) exteriora in phalangem connata et majora et diversiformia, spatha triplo longior et duplo angustior, necnon spadix duplo longior. [Guiana.]

GRAMINEÆ.

Paspalum simplex, Morong, in Ann. New York Acad. Sc. vii. (1893) p. 258.

Hab. Ad Puerto Pacheco floret mens. Feb. (N. 1051.) [Paraguaria.]

Paspalum conjugatum, Bergius, in Acad. Helv. vii. p. 129.

Hab. Crescit in cacumine montium Serra da Chapada, itaque ad Santa Cruz. (Nn. 130, 728.) [America, a Brasiliâ usque ad Mexico.]

Paspalum paniculatum, Linn. Syst. ed. X. p. 855. Var. minor, nob.

Planta non ultra 25·0 cm. alt. Folia parva, linearia, circa 5·0 cm. long. Spicæ paucæ (5), patulæ, breves, 2·0–3·0 cm. long.

Hab. Inveni ad Serra da Chapada, prope Santa Anna da Chapada, mens. Aug. (N. 134.)

Although dissimilar in habit from typical *Paspalum paniculatum*, this plant agrees so closely with it in the spikelets that I am unwilling to describe it as a new species. It is probably merely an upland state of *P. paniculatum*. [Bras. Or., Goyaz, Amazonia, Ind. Occ.]

PASPALUM INÆQUIVALVE, Raddi, Agrost. Bras. p. 28.

Hab. Santa Cruz, Dec. (N. 772.) [Bras. Or., Paraguaria.]

PASPALUM TROPICUM, Doell, in Mart. Fl. Bras. ii. pars 2, p. 83.

Hab. Viget inter Cuyabá et Serra da Chapada, mens. Aug. florens. (N. 47.) [Bras. Or.]

PASPALUM CORYPHÆUM, Trin. Diss. ii. p. 114.

Hab. Crescit in paludibus prope Corumbá, ubi florescit mens. Jan. (N. 1013.)

A form with auriculate leaves, and agreeing well with Riedel's no. 43, except that the spikes are more pilose. [Bras. Or.]

PASPALUM CAPILLARE, Lam. Illustr. i. p. 176.

Hab. Incolit locos apertos prope Santa Anna da Chapada, ad alt. 700 met., mens. Aug., itaque Santa Cruz, mens. Dec. (Nn. 115, 747.)

There seem to be two forms of this plant: in one the spikelets are arranged upon very slender axes, and the glumes are smaller than are those of the other form, which, moreover, has broader axes. To this second form, which, I am inclined to think, may turn out to be a new species, belong my specimens and Gardner's no. 2348; but I do not feel justified, without further study of this difficult genus, in disarranging, even to a slight extent, the careful work of Doell. [Bras. Or., Goyaz, Amazonia, Guiana, Peruvia.]

PASPALUM TRISTACHYUM, Lam. Illustr. p. 176.

Hab. Inveni passim juxta Santa Cruz. (Nn. 327, 762, 771.) [Amer. Austr. Trop. et Subtrop.

ERIOCHLOA PUNCTATA, Ham. Prod. p. 5.

Hab. Reperi ad Puerto Pacheco florentem mens. Feb. (N. 1055.) [America, e Paraguariâ usque Mexico, itaque in Australiâ lecta.]

PANICUM HORIZONTALE, G. F. W. Mey. Prim. Fl. Esseq. p. 54. (*P. sanguinale*, Linn., var. *distans*.)

Hab. In cacumine montium Serra da Chapada, 700 met. alt., mens. Aug. (Nn. 117, 133.) [In Americâ calidiore et Ind. Occ. late diffusa.]

PANICUM LEUCOPHÆUM, H. B. K. Nov. Gen. et Sp. i. p. 97.

Hab. Santa Cruz, Dec. (N. 773.) [Bras. Or., Goyaz, Amazonia, Guiana, Uruguaria.]

PANICUM ANSATUM, Trin. Spec. Gram. sub tab. 279.

Hab. Inter Cuyabá et Serra da Chapada mens. Aug. florescit. (N. 55.)

Hujus reperi varietatem insequentem :—

Var. LINEARIFOLIA, nob.; foliis anguste linearibus, usque 10·0 cm. long., modo 0·1 cm. lat.

Hab. Inter Santa Cruz et Villa Maria florebat mens. Dec. (N. 851 *a*.) [Matto Grosso.]

PANICUM (§BRACHIARIA) FURCELLATUM (sp. nov.) (Tab. XXXIV. figg. 14–22); culmo erecto, gracili, striato, deorsum geniculato; foliorum vaginis amplis, crebre nervosis, plus minusve (præsertim superne) pilosis vel piloso-villosulis, ceteroquin puberulis, nonnunquam prorsus pilis strigosis appressis subdense munitis; ligulâ brevissimâ, truncatâ, membranaceâ, apice albido-ciliatâ; laminâ anguste lineari acuminatâ, margine (imprimis inferne) plus minus albido-ciliatâ, nonnunquam fere glabrâ; paniculâ a basi bifurcâ; spicis subæqualibus, spicâ inferiore sessili vel subsessili, superiore pedunculatâ, rarius subsessili; axe subtriquetro, puberulo; spicæ axibus ancipitibus, marginibus sæpe breviter ciliolatis, anfractis, basi appresse hirsuto-pilosis; spiculis sessilibus vel breviter pedunculatis, distichis, secundis laxiuscule imbricatis, alternis ovatis obtusis, obsolete puberulis; glumâ I. anticâ, spiculam $\frac{3}{4}$ æquante, oblongâ obtusâ, 3-nervi, concavâ, subplanâ; glumâ II. quam I. longiore, ovato-oblongâ acutâ, 5-nervi, concavâ; glumâ III. glumam II. æquante eique subconformi, 5-nervi, cassâ; valvulis ovato-oblongis acutis, glumâ III. paullo brevioribus, inferiore semiterete, 3-nervi, superiore dorso excavatâ 2-nervi.

Hab. Crescit ad Santa Cruz, ubi spicas profert mens. Dec. (N. 763.)

Culmus ad 50·0 cm. alt., usque ad 0·1 cm. diam., dilute virens, nodis pubescentibus. Vaginæ compressæ, apice truncatæ, intus puberulæ, explanatæ 0·4 cm. lat. Ligula brunea, pilis albis 0·3 cm. long. instructa. Foliorum lamina ad 26·0 cm. long., 0·1 cm. lat., lateraliter compressa, in sicco dilute virescens. Spicæ 4·0–5·5 cm. long., 0·25 cm. lat., suberectæ, a basi divergentes, pedunculo spicæ superioris vix usque 2·0 cm. long. Spiculæ 0·4–0·45 cm. long., albidæ; pedunculus complanatus, vix ad 0·2 cm. long., axi appressus, puberulus, ipsâ sub spiculâ leviter incrassatus. Gluma I. 0·3 cm. long., gluma II. 0·4 cm. long. Valvulæ scabræ, inferior 0·4 cm. long., 0·15 cm. lat., ambæ firmæ. Squamulæ 0·04 cm. et antheræ 0·25 cm. long. Ovarium anceps, ambitu oblongum. Stigma bruneo-violaceum, circa 0·1 cm. long.

Species singularis, habitum *Paspali* simulans, forsan prope *P. plantagineum*, Linn., inserenda, sed facile distinguenda, imprimis foliis toto cœlo disparibus, spicis bifurcis, glumâ inferiore (anticâ nec posticâ) spiculam fere æquante. [Bras. Or., Goyaz.]

This grass is treacherously like *Paspalum tropicum*, Doell, and *P. Neesii*, Kth., so much so that dissection is necessary in order to distinguish it.

PANICUM CHLOROTICUM, Nees, in Trin. Diss. ii. p. 236. Var. AGRESTE.

Hab. Crescit in ripâ fl. Paraguay juxta Santa Cruz, mens. Oct. florens. (N. 504.) [Bras. Or., Amazonia, Guiana.]

PANICUM POLYGAMUM, Sw. Prod. Fl. Ind. Occ. p. 24. (*P. maximum*, Jacq.)

Hab. Coimbrá, mens. Feb. florens. (N. 1070.) [Amer. Austr. Trop. et Subtrop.; Ind. Occ.]

PANICUM MEGISTON, Schult. Mant. ii. p. 248.

Hab. Viget ad ripas fl. Paraguay inter Santa Cruz et Villa Maria, itaque juxta Corumbá, mens. Dec.–Jan. florens. (Nn. 828, 1014.) [Bras. Or., Amazonia, Guiana, Uruguaria, Paraguaria.]

PANICUM STOLONIFERUM, Poir. Encyc. Suppl. iv. 1, p. 274.

Hab. Inter Santa Cruz et Villa Maria, ubi mens. Dec. spicas profert. (N. 825.) [Bras. Or., Amazonia, Guiana, Ind. Occ., Venezuela, Uruguaria.]

PANICUM PILOSUM, Sw. Prod. Fl. Ind. Occ. p. 22.

Hab. Inter Santa Cruz et Villa Maria, mens. Dec. (N. 817.) [Bras. Or., Amazonia, Guiana, Venezuela, Paraguaria, Uruguaria.]

PANICUM LAXUM, Sw. Prod. Fl. Ind. Occ. p. 23.

Hab. Santa Cruz, Dec. (N. 748.) [Amer. Sept. et Austr., Ind. Occ.]

PANICUM PROCURRENS, Nees, Agrost. Bras. p. 130.

Hab. Santa Cruz, Dec. (N. 757.) [Bras. Or.]

ICHNANTHUS PALLENS, Munro, in Benth. Fl. Hongkong. p. 414.

Hab. In angustiis ad Serra da Chapada, mens. Aug. (N. 175.) [In tropicis utriusque orbis late disseminatus.]

ICHNANTHUS BREVISCROBS, Doell, in Mart. Fl. Bras. ii. pars 2, p. 294.

Hab. Crescit in sylvâ primævâ inter Santa Cruz et Campos de Tapirapuan, mens. Sept. florens. (N. 405.)

Forma a typo divergens spicis paullulum minoribus et glumis angustioribus.

Hujus speciei specimina ante oculos nuper habui a cl. Jenman ex Guianâ missa. (Nn. 2088, 2461 in Hb. Kew.) [Amazonia, Guiana.]

OPLISMENUS SYLVATICUS, Roem. & Schult. Syst. Veg. ii. p. 481.

Hab. Inter Santa Cruz et Villa Maria, mens. Dec. (N. 815.) [Per utrumque orbem late diffusus.]

SETARIA GRACILIS, H. B. K. Nov. Gen. et Sp. i. p. 109. (*S. glauca*, var. *elongata*, Pers. Syn. i. p. 81.)

Hab. Santa Cruz, Nov. (N. 549.) [Amer. Austr., Ind. Occ.]

SETARIA MACROSTACHYA, H. B. K. Nov. Gen. et Sp. i. p. 110.

Hab. Coimbrá, Feb. (N. 1081.) [Bras. Or., Goyaz, Amazonia, Guiana.]

SETARIA PENICILLATA, Presl, Rel. Haenk. i. p. 314.

Hab. Ad Santa Cruz, inter Santa Cruz et Villa Maria, ad Coimbrá, et ad Puerto Pacheco. (Nn. 756, 829, 1081 *a*, 1092 *a*.) [Amer. Trop. et Subtrop.]

Olyræ sp. nimis imperfecta, ex affinitate *O. latifoliæ*, Linn. Erecta, elata, foliis brevissime petiolatis, ovato-lanceolatis, caudato-acuminatis, basi impariter rotundatis, brevissime cordatis, 4·0–5·0 cm. lat., usque ad 17·0 cm. long.; vaginis arcte applicatis, crebre striatis, glabris; ligulâ ut in *O. latifoliâ*; paniculis terminalibus abbreviatis, pubescentibus, ramis inferne masculis, superne femineis; spiculorum masc. valvulis ignotis, spiculorum fem. glumis brevibus, ovatis, acuminatis, rarius breviter aristato-caudatis nec ultra 1·0 cm. long., glumâ superiore 5-nervi. valvulis —.

Hab. Reperi jam valvulis orbam in sylvâ primævâ inter Santa Cruz et Campos de Tapirapuan mens. Sept. (N. 403.)

Ab *O. latifoliâ*, cujus fortasse mera varietas, distat præsertim foliis longioribus latioribus et glumis brevioribus. [Bras. Or., Goyaz, Amazonia, Guiana, Ind. Occ.]

Pariana, sp. nov.; culmorum fertilium vaginis subinflatis, spicis erectis, flosculorum masculorum pedicellis involucrantibus, puberulis, inferne albido-pilosis; glumis late triangulari-lanceolatis, breviter acuminatis, pedicellis paullo longioribus a valvulis oblongis acutiusculis tertiâ vel quartâ parte superatis; reliquis ignotis.

Hab. Floret ad Santa Cruz mens. Dec. (N. 540 *a.*)

Ab affini *P. zingiberinâ*, cujus specimina ante oculos habui in Herb. Kew. asserv. (*Appun* n. 710, *Poiteau* sine no.) abhorret præsertim glumis latioribus, breviter acuminatis, et valvulis minoribus.

The species of *Pariana* with simply scapose inflorescences do not occur in Eastern Brazil, where the genus is represented by only two species belonging to the group with foliate inflorescence. [Amazonia, Guiana.]

Luziola pusilla (sp. nov.) (Tab. XXXVII. figg. 1–8); culmo pro genere brevi, erecto, vix ultra 10·0 cm. alt., a foliis superato, subterete, gracillimo, obsolete puberulo; vaginis pubescentibus, striatis; ligulâ membranaceâ, exsertâ, subulatâ, acuminatâ; foliis anguste linearibus, acuminatis, obsolete scabriusculis; paniculâ masculâ ignotâ; paniculis omnibus mihi obviis femineis, contractis vel rarius subpatulis, axe gracillimo, glabro, ad axillas breviter piloso, spiculis parvis linearibus, acutis, axibus tenuibus flosculo æquilongis vel longioribus fultis, rectis vel parum curvatis; valvulis membranaceis, oblongis, valvulâ inferiore superiore obtusâ 8-nervi paullo breviore et truncatâ et 11-nervi; caryopside ovoideo-subglobosâ, obtusâ, in longitudinem costulato-striatâ, glabrâ.

Hab. Crescit ad Santa Cruz, ubi mens. Dec. flores masculos inveni. (N. 760.) Itaque vidi in Hb. Kew. specimina ejusdem speciei in Guianâ Britannicâ a Parker lecta.

Rhizoma abbreviatum, sat tenue, radices graciles paucas sustinente. Culmi herbacei, sæpe foliis duplo breviores, virescentes. Vaginæ foliis sæpius $1\frac{1}{2}$–2-plo breviores, explanatæ circa 0·2 cm. lat., infimæ culmum vix amplectentes; ligula erecta, 0·1–0·2 cm. long.; lamina erecta, plerumque 5·0–10·0 cm. long., vix usque ad 0·3 cm. lat. (modica 0·22 cm.), margine plus minus undulata, viridis. Paniculæ rami modici 1·5–2·0 cm. long. Spiculæ graciliter pedunculatæ, 0·4–0·45 cm. long. Stigmata alba, 0·13 cm. long. Squamulæ obovatæ, obtusissimæ, 0·02 cm. long. Caryopsis brunea, 0·17 cm. long., styli reliquiis coronata.

Ex affinitate *Luziolæ longivalvulæ*, Doell, sed nullo negotio cognoscenda ob habitum humilem rigidiusculum, folia minora et angustiora, valvulam fll. fem. inferiorem 11-nervem et superiorem 8-nervem, caryopsidem ovoideo-subglobosam nec ellipsoideam costulato-striatam. [Guiana.]

MELINIS MINUTIFLORA, Beauv. Essai, p. 54.

Hab. Inter Cuyabá et Serra da Chapada, itaque in cacumine hujus, Aug. (Nn. 68, 152.)

Forma pusilla, 20·0 cm. alt. Foliorum lamina vix ultra 2·0 cm. long.

This is the celebrated *Capim Gordura* of the Brazilians; its distribution is remarkable. [Bras. Or., Goyaz, Ascension, Afr., Austr., Madagascar.]

ARTHROPOGON VILLOSUS, Nees, Agrost. Bras. p. 319. Var. GLABRESCENS, nob.

A typo distat vestitu foliorum obsoleto.

Hab. Inter Cuyabá et Serra da Chapada, mens. Aug. (Nn. 5763.) [Bras. Or.]

IMPERATA BRASILIENSIS, Trin. in Mém. Acad. Pétersb. sér. vi. 2, p. 331.

Hab. Coimbrá, Feb. (N. 1069.) [Amer. Trop. et Subtrop.]

ANDROPOGON CONDENSATUS, H. B. K. Nov. Gen. et Sp. i. p. 188. Subsp. CORYMBOSUS and GENUINUS.

Hab. Inter Cuyabá et Serra da Chapada, mens. Aug. (N. 52.)

ANDROPOGON CONDENSATUS, H. B. K., var. PANICULATUS.

Hab. Coimbrá, mens. Feb. florens. (N. 1077.)

At Coimbrá this fine grass grows to the height of a man, which greatly exceeds the maximum height mentioned by Doell. [Amer. Trop. et Subtrop.]

ANDROPOGON TERNATUS, Nees, Agrost. Bras. p. 326.

Hab. Inter Cuyabá et Serra da Chapada, Aug. (N. 58.) [Bras. Or., Uruguaria, Paraguaria, Argentina.]

ANDROPOGON VIRGINICUS, Linn. Sp. Pl. ed. I. p. 1046.

Hab. Inveni inter Cuyabá et Serra da Chapada, itaque juxta Santa Anna da Chapada, mens. Aug. (Nn. 46, 107.) [America, a Massachusetts usque Repp. Argent. et Parag.]

CHLORIS POLYDACTYLA, Sw. Prod. Fl. Ind. Occ. p. 26.

Hab. Florebat ad Puerto Pacheco mens. Feb. (N. 1054.) [Amer. Trop. et Subtrop., Ind. Occ.]

ELEUSINE INDICA, Gaertn. Fruct. i. p. 8.

Hab. Santa Cruz, Dec. (N. 775.) [In tropicis et subtropicis late disseminata.]

LEPTOCHLOA DOMINGENSIS, Trin. Fund. Agrost. p. 133.

Hab. Santa Cruz, mens. Dec. florens. (N. 774.) [Bras. Or., Goyaz, Amazonia, Peru, Ind. Occ.]

POGOCHLOA, Gramincarum, e tribu Chloridearum, gen. nov. (Tab. XXXVII. figg. 9–23.)

Spiculæ 5-floræ, a latere compressæ, secus rhachidis elongatæ facies inferiori-laterales continuas concavas distiche insertæ; rhachillæ breves vel subnullæ, rhachidi appressæ. Flosculi, flosculo supremo (rarius flosculis duobus superioribus) tabescente exempto, hermaphroditi. Glumæ duæ, membranaceæ, leviter carinatæ, acuminatæ, haud aristatæ, valvulis breviores, gluma superior plurinervis quam inferior paucinervis major. Valvulæ duæ, membranaceæ; valvula inferior elongata, navicularis, 3-nervis, raro subobsolete 5-nervis, apice breviter bidentula, rarius subintegra, carinata, carina in aristam longam terminalem excurrens, nervi laterales haud excurrentes; valvula superior bicarinata, acuminata, flosculi supremi fere ad meram aristam imminuta. Stamina 3; filamenta brevia; antheræ minutæ, inclusæ. Pollinis grana minutissima, ambitu subsphærica. Ovarium stipitatum, glabrum. Squamulæ duæ, apice denticulatæ. Styli a basi liberi. Stigmata elongata, plumosa. Caryopsis ambitu anguste linearis, paleâ inclusa sed ei nequaquam connata, antice acutata, postice sulcata; hilum minimum. Scutellum oblongum, obtusissimum, caryopside circa 4-plo brevius. Folia plana, juvenilia convoluta. Ligula brevissima, membranacea, apice ciliato-barbata. Rhachides simplices, elongatæ, a basi ipsâ spiculigeræ, axi communi plerumque singillatim vel subopposite insertæ.

POGOCHLOA BRASILIENSIS (sp. nov.); culmo erecto terete, subtiliter striato, una cum nodis glabro, in sicco viridi-lutescente; foliorum vaginis circum culmum arcte convolutis, striatis, glabris, dilute lutescenti-viridibus, foliis linearibus longe ac sensim acuminatis, glabris, deorsum levibus, sursum scabriusculis, nervosis, glaucescentibus, 32·0 cm. long., 0·65 cm. lat.; rhachidum axe communi erecto, leviter torto, gracili, quadrangulari, scabro, ultra 30·0 cm. alt.; rhachidibus erecto-ascendentibus vel subpatulis, tenuibus, fere rectis, scabriusculis, plerisque 7·0–14·0 cm. long., supremis imminutis; rhachillis rhachidi applicatis, subteretibus, scabriusculis, plerisque 0·1 cm. (vel paullo ultra) long.; spiculis, aristis haud exemptis, modicis, 2·0 cm. long., 0·1 cm. lat., dilutissime viridibus; glumâ inferiore lanceolatâ, acuminatâ, 2–5-nervi, nervis lateralibus interdum subobsoletis circa 0·5 cm. long.; glumâ superiore 0·6 cm. long., breviter acuminatâ, 6–9-nervi; valvulâ inferiore lanceolatâ, scabridâ, inferne dorso barbatulâ, 0·8 cm. long., aristâ tenui rectâ vel inferne geniculatâ usque ad 1·0 cm. long. instructâ, paleâ lineari-lanceolatâ, 0·4–0·45 cm. long., apice bidentatâ, squamulis subquadratis apice denticulatis; antheris minutis, ambitu ellipticis; ovarii stipite ovario ipsi æquilongo; stigmatibus 0·14 cm. long.; bruneis, caryopside 0·4 cm. long., vix 0·1 cm. lat., in sicco griseo-fuscâ, stigmatibus et deinde solummodo stylis persistentibus coronatâ.

Hab. Reperi ad Coimbrá mens. Feb. florentem. (N. 1080.)

After several unsuccessful attempts to place the grass here described, I have resolved to make a new genus for its reception. The affinity is undoubtedly with *Leptochloa* and with *Diplachne*, the latter a genus referred by the authors of the 'Genera Plantarum' to Festucaceæ, although, since its spiculigerous axes are undoubtedly dorsiventral, that

view, according to which *Diplachne* and *Leptochloa* should be closely associated, seems to me to be the correct one.

The simply spicate inflorescence of *Diplachne*, with its bilobed lower valvule (flowering glume), not to mention other points, at once distinguishes it from *Pogochloa*, while *Leptochloa*, along with much the same type of inflorescence, has much smaller spikelets, 1-nerved glumes, and the lower valvule at most aristulate, and never ending, as does that of *Pogochloa*, in an awn longer than itself. *Uralepis* scarcely differs from *Leptochloa*, except that the lateral veins of its lower valvule run each into a mucro or small tooth.

Some years ago Grisebach (Pl. Lorentz. p. 211) described an Argentine grass under the name of *Tricuspis latifolia*, making for it a new section of *Tricuspis* (§ *Neuroblepharum*), but this, although with many points of resemblance to *Leptochloa* in respect of the structure of its spikelets, differs from it in possessing a truly Festucaceous inflorescence.

The peculiar points about *Pogochloa* are :—

i. The spikelets much larger than those of *Diplachne* and *Leptochloa*.

ii. The several-nerved glumes, the lower glume having up to five, the upper often as many as nine strong nerves.

iii. The long awns of the flowering glumes.

In the structure of its leaf (Tab. XXXIX. fig. 14) *Pogochloa* conforms to that type which is known by the presence of chlorophyll in all, or at least almost all, of its parenchyme-cells. As seen in transverse section, the structure varies considerably, but all the larger bundles of sections examined by me agree in this,—that a row of sclerenchyme is interposed between the xylem and the phloëm, while the smaller bundles are without this. The vessels have not the V-shaped arrangement. Immediately surrounding the sclerenchyme is a bundle-sheath consisting of a few large chlorophyll-cells, outside which lies a mass of small chlorophyll parenchyme elements. Midway between the vascular bundles on the upper side of the leaf is a shallow depression, beneath which is a group of large cells without chlorophyll. The arrangement of these cells varies according to the section; frequently three cells are to be seen, one central, with another on each flank; more rarely the arrangement is as shown in the figure. The shaded cells in this figure, it should be added, represent the chlorophyll parenchyme.

Along the broader side of the caryopsis there is a narrow chamber, not seen, however, until removal of the outer portion of the testa by which it is overlain (fig. 15 *a*.). The wall of the fruit is made up of five layers of small cells, beneath which is a single layer of large cells containing a red fluid; these large cells form the bounding-walls of the above-named chamber (fig. 15 *b*). The gluten-layer (*gl.*) is of a single row of very small cells, and beneath it lies the starch parenchyme.

ERAGROSTIS ARTICULATA, Nees, Agrost. Bras. p. 502.

Hab. Reperi ad Santa Cruz mens. Dec. (N. 759.) [Bras. Or., Goyaz.]

ERAGROSTIS REPTANS, Nees, Agrost. Bras. p. 514.

Hab. Crescit ad Santa Cruz, ubi mens. Nov. floret. (N. 602.) [Per Americam late diffusa.]

ERAGROSTIS (§ PTEROESSA) MULTIPES (sp. nov.); culmis erectis, gracilibus, humilibus, subcongestis, glabris, striatulis; foliorum vaginis glabris, striatis, fauce nudis; ligulâ brevissimâ, calvâ vel pilis albidis instructâ; laminâ anguste lineari acuminatâ, utrinque levi nervosâ; paniculis subconfertis, ramis plerumque 1–3-spiculatis, interstitia subæquantibus vel quam ea longioribus; spiculis elongatis, linearibus, erectis, modicis, 20–40-floris, plerisque subsessilibus; glumis lanceolatis, acuminatis, 1-nervibus, glumâ inferiore quam flos proximus paullo breviore, superiore quam flos proximus paullo longiore; flosculis arcte imbricatis; valvulâ inferiore ovatâ, acuminatâ, 3-nervi, superiore oblanceolatâ, 2-nervi, plane longiore.

Hab. In cacumine montium Serra da Chapada prope Santa Anna da Chapada reperi mens. Aug. (N. 131.)

Culmus 4·0–12·0 cm. alt., nodis glabris, decoloribus. Foliorum vaginæ explanatæ 0·1 cm. lat. Laminæ pleræque circa 2·5 cm. long. et 0·1 cm. lat., erectæ. Paniculæ 3–12-spiculatæ, obsolete scabriusculæ, spiculæ ætate distantes, usque ad 1·3 cm. long., 0·12 cm. lat. Valvulæ superiores in carinis minute ciliolatæ.

E. panamensi, Presl (*E. aciculari*, Trin., *E. maypurensi*, Doell), arcte affinis, differt vero imprimis ob vaginas glabras fauce nudas, laminam latiorem glabram, et spiculas plurifloras, graciliores, valvulas minus acuminatas ostendentes. [Bras. Or., Amazonia, Mexico.]

ERAGROSTIS VAHLII, Nees, Agrost. Bras. p. 499.

Hab. Crescit in cacumine montium Serra da Chapada, mens. Aug. florens. (Nn. 116, 135, 136.) [Bras. Or., Goyaz, Amazonia, Guiana, Columbia.]

ERAGROSTIS CILIARIS, Link, Hort. Berol. i. p. 192.

Hab. Santa Cruz, Nov. (N. 584.) [In tropicis et subtropicis late diffusa.]

ERAGROSTIS ELEGANS, Nees, Agrost. Bras. p. 510.

Hab. In ripâ fl. Paraguay inter Santa Cruz et Diamantino. (N. 633.) [In tropicis et subtropicis frequens.]

CYPERACEÆ.

(Determ. cl. C. B. CLARKE.)

CYPERUS ADENOPHORUS, Schrad. ex Nees in Mart. Fl. Bras. ii. pars i. p. 28.

Hab. Ad Santa Cruz mens. Nov. floret. (N. 595.)

CYPERUS ADENOPHORUS, Schrad., var. β. APHYLLA, Boeck.

Hab. E Santa Cruz habui sine numero. [Amer. Trop. et Subtrop.]

CYPERUS LUZULÆ, Retz. Obs. iv. p. 11.

Hab. Ad ripas fl. Brasinho floret mens. Oct. (N. 426.)

Huc forsan releganda specimina nimis juvenilia juxta fl. Paraguay inter Santa Cruz et Villa Maria lecta mens. Dec. (N. 642.) [Amer. Trop., Ind. Occ.]

CYPERUS SIMPLEX, H. B. K. Nov. Gen. et Sp. i. p. 207.
Hab. Crescit ad Santa Cruz et in viciniâ. (Nn. 326, 790.) [Amer. Trop., Ind. Occ.]

MARISCUS SETIGLUMIS, C. B. Clarke; spicularum glumâ imâ vacuâ setaceo-caudatâ, ceteroquin ut *Cyperus strigosus*, Link.
Hab. Floret ad Santa Cruz mens. Dec. (N. 746.) [Bras. Or., Argentina.]

MARISCUS JACQUINII, H. B. K. Nov. Gen. et Sp. i. p. 216.
Hab. Vigebat juxta fl. Paraguay inter Santa Cruz et Villa Maria. (N. 831.) [Bolivia, Columbia, Venezuela, Amer. Centr., Mexico, Ind. Occ.]

KYLLINGA PUNGENS, Link, Hort. Berol. i. p. 326.
Hab. Ad Santa Cruz floret mens. Nov. (N. 673.) [Amer. Trop. et Subtrop., Afr. Trop., Java.]

KYLLINGA PUMILA, Michx. Fl. Bor.-Amer. i. p. 28.
Hab. Crescit ad Santa Cruz, ubi mens. Nov. floret. (N. 671.) [In tropicis et subtropicis late diffusa.]

ELEOCHARIS PUNCTATA, Boeck. in Kjoeb. Vidensk. Meddel. 1869, p. 132 (non Steud.).
Hab. Legi in paludibus ad Santa Cruz mens. Nov. (N. 530.) [Bras. Or., Amazonia, Guiana, Ind. Occ.]

ELEOCHARIS SULCATA, Nees, in Linnæa, ix. p. 294; forma emarginata (*E. emarginata*, Klotzsch).
Hab. Ad Serra da Chapada inveni mens. Aug. florentem. (N. 112.) [Amer. Trop. et Subtrop., Ind. Occ.]

ELEOCHARIS OCHREATA, Nees, in Linnæa, ix. p. 294.
Hab. In cacumine montium Serra da Chapada mens. Aug. floret. (N. 108.) [Amer. Trop. et Subtrop. (et var. *humilis*, Boeck., gerontogæa).]

DICHROMENA CILIATA, Vahl, Enum. ii. p. 240.
Hab. Crescit ad Serra da Chapada. (N. 67.) [Amer. Trop. et Subtrop.]

FIMBRISTYLIS DIPHYLLA, Vahl, Enum. ii. p. 289.
Hab. Florebat ad Santa Cruz mens. Dec. (N. 743.) [In utroque orbi vulgatissima.]

BULBOSTYLIS JUNCIFORMIS, C. B. Clarke. (*Isolepis junciformis*, Kunth, Enum. ii. p. 211.)
Hab. Viget ad Serra da Chapada mens. Aug. (N. 179.)
Exemplum parvulum nimis juvenile. [Amer. Austr. Trop.]

LIPOCARPHA SELLOWIANA, Kunth, Enum. ii. p. 267.
Hab. Prope Santa Cruz legi mens. Nov. (N. 596.) [Bras. Or.]

HYPOLYTRUM LONGIFOLIUM, Nees, in Linnæa, ix. p. 288.
Hab. Crescit in sylvâ primævâ inter Santa Cruz et Campos de Tapirapuan. (N. 404.) [Amazonia, Guiana, Ins. Trinitatis.]

HYPOLYTRUM IRRIGUUM, Nees in Mart. Fl. Bras. ii. 1, p. 68.

Hab. Inveni in ripâ fl. Paraguay inter Santa Cruz et Diamantino, necnon inter Santa Cruz et Villa Maria. (Nn. 635, 816.) [Amazonia.]

RYNCHOSPORA MINARUM, Steud. Cyp. p. 143.

Hab. Crescit inter Cuyabá et Serra da Chapada, mens. Aug. florens. (N. 61.) [Bras. Or.]

RYNCHOSPORA EXALTATA, Kunth, Enum. ii. p. 291.

Hab. Reperi ad ripas fl. Paraguay inter Santa Cruz et Diamantino. (N. 641.) [Amer. Austr. Trop., Ind. Occ.]

RYNCHOSPORA CEPHALOTES, Vahl, Enum. ii. p. 237.

Hab. Crescit in ripâ fl. dos Bugres, mens. Oct. florens. (N. 425.)

RYNCHOSPORA CEPHALOTES, Vahl, var. δ. INTERRUPTA.

Hab. Inveni ad Serra da Chapada mens. Aug., itaque prope Santa Cruz mens. Sept. (Nn. 80, 323.) [Amer. Centr. et Austr. Trop., Ind. Occ., Chili.]

RYNCHOSPORA GLAUCA, Vahl, Enum. ii. p. 233.

Hab. Legi ad Serra da Chapada mens. Aug. (N. 149.) [Regg. calid. utriusque orbis.]

SCLERIA MICROCARPA, Nees in Linnæa, ix. p. 302.

Hab. Viget in ripâ fl. Paraguay inter Santa Cruz et Villa Maria mens. Dec. (N. 836.) [Bras. Or., Amazonia, Guiana, Ind. Occ.]

SCLERIA FLAGELLUM, Sw. Prod. Fl. Ind. Occ. p. 18.

Hab. Floret ad Santa Cruz mens. Oct. (N. 485.) [A Bras. Or. usque ad Ind. Occ.]

CYCADEÆ.

ZAMIA BRONGNIARTII, Wedd. in Ann. Sc. Nat. sér. 3me xiii. p. 249.

Hab. Frequens juxta Santa Cruz et ad Campos de Tapirapuan, ubi menss. Sept. et Oct. floret.

The female cones are always solitary, but of the male cones three or even four may arise from the same rootstock. Weddell found this plant in the neighbourhood of Villa Maria and on the journey from that town to Matto Grosso (Villa Bella). Santa Cruz is the most easterly point at which it has been seen, and also, so far as known, marks the limit of eastward extension of Cycads in South America. [Bolivia Or.]

EXPLANATION OF THE PLATES.

(Unless otherwise indicated in brackets beside the figures, the drawings represent the objects natural size.)

Plate XXI.

Fig. 1. *Ephedranthus parviflorus*: branch. 2. A bud. 3. A male flower seen from above, and 4. in section. 5. A stamen seen in a front (*a*) and (*b*) hind view. 6. Pollen. 7. Diagram of male flower.

Plate XXII.

Fig. 1. *Stormia brasiliensis*. 2. A bud from below, showing the enlarged receptacle. 3. A sepal from within. 4. Petals. 5. Ditto, showing the cohesion. 6. Petal of outer whorl detached. 7. Ditto of inner whorl. 8. Flower in section. 9. A stamen (*a*) from the axial and (*b*) from the abaxial side. 10. Group of pollen-grains. 11. Torus with carpels. 12. A single carpel showing the large stigma. 13. Carpel opened longitudinally from the abaxial side. 14. Floral diagram.

Plate XXIII.

Fig. 1. *Helicteres orthotheca*. 2. Petal from a bud. 3. Gynandrœcium. 4. Ditto in longitudinal section. 5. Ovary in transverse section. 6. Fruit. 7. Ripe fruit of *Peixotoa hirta*, Mart. 8. A samara detached from the same.

Plate XXIV.

Fig. 1. *Zizyphus oblongifolius*. 2. A flower detached. 3. Detached petal. 4. Flower in section.

Plate XXV.

Fig. 1. *Anguria gloriosa* (male plant). 2. A flower-bud opened. 3. Two views of a stamen.

Plate XXVI.

Fig. 1. *Psychotria homoplastica*. 2. Portion of inflorescence detached. 3. A flower. 4. Corolla opened longitudinally. 5. Section of ovary, showing also the disk, style, and stigmas. 6. Ripening fruit of *Alibertia verrucosa*.

Plate XXVII.

Fig. 1. *Ipomœa crinicalyx*.—2–9. *Desdemona pulchella*. 3. A bud just before expansion of the corolla. 4. Corolla opened by a longitudinal incision. 5. Pollen. 6. Pistil. 7. Ovary opened from the side, showing a single pendulous ovule. 8. Longitudinal section of an ovary hardened in alcohol, showing the pendulous ovules with ventral raphe. 9. The floral diagram.

Plate XXVIII.

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Plate XXIX.

Fig. 1. *Heterocroton mentiens.* 2. A male flower opened. 3. A detached sepal; 4. A petal; 5. A stamen; and 6. Pollen-grains. 7. Calyx of female flower. 8. Part of same showing the glands, etc. 9. Pistil. 10. Supposed placentation, but, owing to want of material, there is some doubt about this. 11. Floral diagram of male flower.

Plate XXX.

Fig. 1. *Mabea Indorum.* 2. Part of male inflorescence detached. 3. Calyx and ovary of female flower. 4. Ditto in longitudinal section. 5. A seed.—6–12. *Brosimopsis lactescens* (male plant). 7. Inflorescence in longitudinal section. 8. A male flower expanding. 9. Ditto expanded. 10. Flower from which the petals have been removed. 11. Pollen. 12. Floral diagram.

Plate XXXI.

Fig. 1. *Brosimopsis lactescens* (female plant). 2. Inflorescence in longitudinal section. 3. A seed. 4. The same, the testa removed to show the radicle (*r*), plumule (*pl*), and cotyledons (*c*).

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Plate XXXIII.

Fig. 1. *Costus acaulis.* 2. A flower detached. 3. A stamen. 4. Part of same showing anther-cells and distribution of vascular bundles. 5. Stigma.—6. *Vanilla ensifolia ?*, Rolfe.

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Plate XXXV.

Fig. 1. *Aphyllarum tuberosum.* 2. A detached spathe and spadix. 3. Spathe opened and for the most part removed, to show attachment of spadix. 4. Group of synandria seen from above. 5. Side view of a synandrium. 6. Ditto in transverse section: *l. c.* latex-canals entirely or partially surrounding the vascular bundles; *rs.* resin-sacs; *sc.* sclerenchyme. 7. Mature and effete pollen-grains. 8. Group of female flowers from above. 9. Ovary opened from the side, and 10. from the back. 11. A single ovule, showing its anatropy. 12. Diagram showing relation between the vascular bundles and sclerenchyme masses in the scape. 13. The three ovules from an ovary of *Caladium heterotypicum.*

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Plate XXXVII.

Fig. 1. *Luziola pusilla*. 2. Female inflorescence. 3. Lower valvule. 4. Upper valvule. 5. Pistil. 6. Lodicule. 7. Inflorescence bearing a caryopsis. 8. Ripe caryopsis magnified.—9–23. *Pogochloa brasiliensis*. 10. Diagrammatic scheme of floral arrangement. 11. A spikelet. 12. Glume I. 13. Glume II. 14. Lower valvule. 15 and 16. Upper valvule. 17. A stamen. 18. Pollen-grains. 19. A lodicule. 20. Pistil. 21. View of the upper part of a spikelet, showing the rudimentary floscule. 22 and 23. Views of the ripe caryopsis.

Plate XXXVIII.

Figs. 1–4. *Ephedranthus parviflorus*. 1. Stem in transverse section; *sc.* sclerenchyme; *ph.* phellogen; *end.* endoderm; *per.* pericycle; *prx.* protoxylem. 2. View of a small piece of leaf from above, showing the crystal-containing epidermal cells which form the outer covering of the ribs. 3. Transverse section of leaf, showing sclerenchyme running up to the epiderm. 4. Small piece of epiderm detached: *s.* subsidiary cells of stomate.—5–12. *Stormia brasiliensis*. 5. Transverse section of stem (lettering as before). 6. Epiderm from lower side of a leaf: *s.* the subsidiary cells. 7. Section of leaf: *gl.* an immersed gland. 8. Diagram showing arrangement of the leaf-traces. 9. Diagrammatic view of an anther-cell, showing the row of superposed pollen-chambers. 10. An anther in transverse section; *ax.* axial and *ab.* its abaxial side; *sc.* sclerenchyme elements; *vb.* the delicate vascular bundle; *me.* the septal membrane (the cells here are too sharply outlined and are not quite correctly shown, see fig. 12). 11. A pollen-chamber in longitudinal section (lettering as before). 12. View of a portion of an anther in transverse section, showing part of a septal membrane.

Plate XXXIX.

Figs. 1–5. *Desdemona pulchella*. 1. Stem in transverse section: *sc.* sclerenchyme masses at corners of stem; *scp.* sclerotic parenchyme cell; *bf.* scattered groups of bast-fibres. 2. Section through midrib of leaf. 3. View of a gland upon the upper face of a leaf. 4. The same seen from above. 5. Epiderm from above, showing the puckered walls.—6–12. *Brosimopsis lactescens*. 6. Section of stem (lettering as in last Plate). 7. Leaf in transverse section. 8–9. Latex-tubes and cells from the pith. 10–12. Ditto from a cotyledon. 13. Diagrammatic view of magnified leaf of *Zygella graminea* in transverse section, showing relation between the vascular bundles and the masses of sclerenchyme. 14. Leaf of *Pogochloa brasiliensis* in transverse section; the cells containing chlorophyll are shaded. 15. Ripe grain of the same in section. 16. Part of the grain more highly magnified: *gl.* the gluten (aleurone) layer.

EPHEDRANTHUS PARVIFLORUS.

Spencer Moore.

R. Morgan del. et lith.
S. Moore anal.

STORMIA BRASILIENSIS.

R. Morgan del. et lith.
S. Moore anal.

West, Newman imp.

1-6. HELICTERES ORTHOTHECA.   7-8. PEIXOTOA HIRTA.

Trans. Linn. Soc. Bot. Ser. 2. Vol. IV. Pl. 24.

S. Moore ana.
R. Morgan del. et lith.

West, Newman imp.

ZIZYPHUS OBLONGIFOLIA

R. Morgan del. et lith.
S. Moore anal.

ANGURIA GLORIOSA, ♂.

West, Newman imp.

R. Morgan del et lith.
S. Moore anal.

1–5. PSYCHOTRIA HOMOPLASTICA. 6. ALIBERTIA VERRUCOSA.

West, Newman imp.

H. Morgan del. et lith.
S. Moore anal.

1. IPOMŒA CRINICALYX. 2-9. DESDEMONA PULCHELLA.

West, Newman imp.

R. Morgan del. et lith.
S. Moore anal.

1-4 NEEA HERMAPHRODITA 5-6 TRIPLARIS FORMOSA.

West, Newman imp.

R. Morgan del. et lith.
S. Moore anal.

HETEROCROTON MENTIENS.

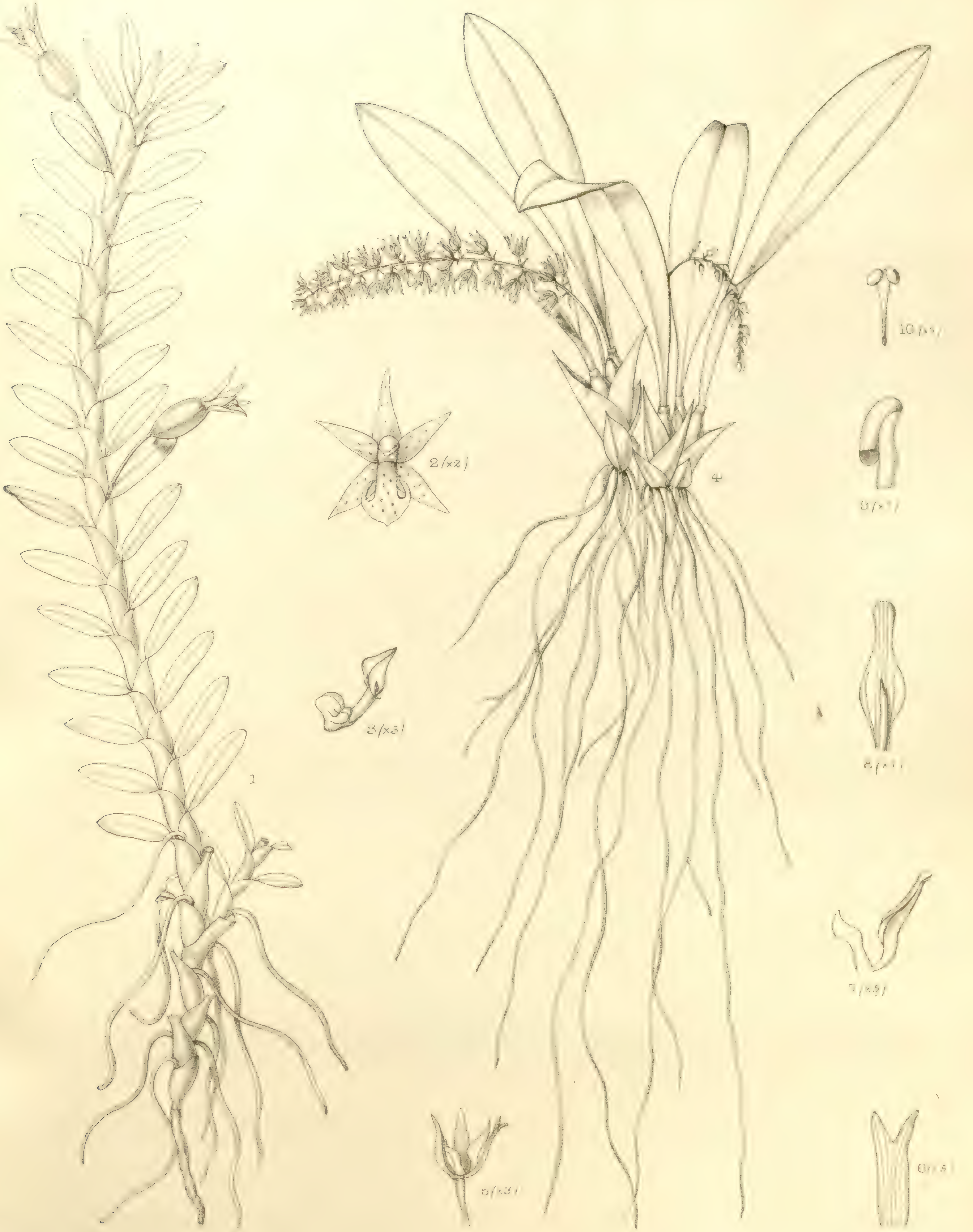
Nest Newman imp.

R. Morgan del et lith.
S. Moore anal.

West Newman imp.

1-5 MABEA INDORUM. 6-12 BROSIMOPSIS LACTESCENS ♂.

BROSIMOPSIS LACTESCENS ♀



R Morgan del et lith
S Moore anal.

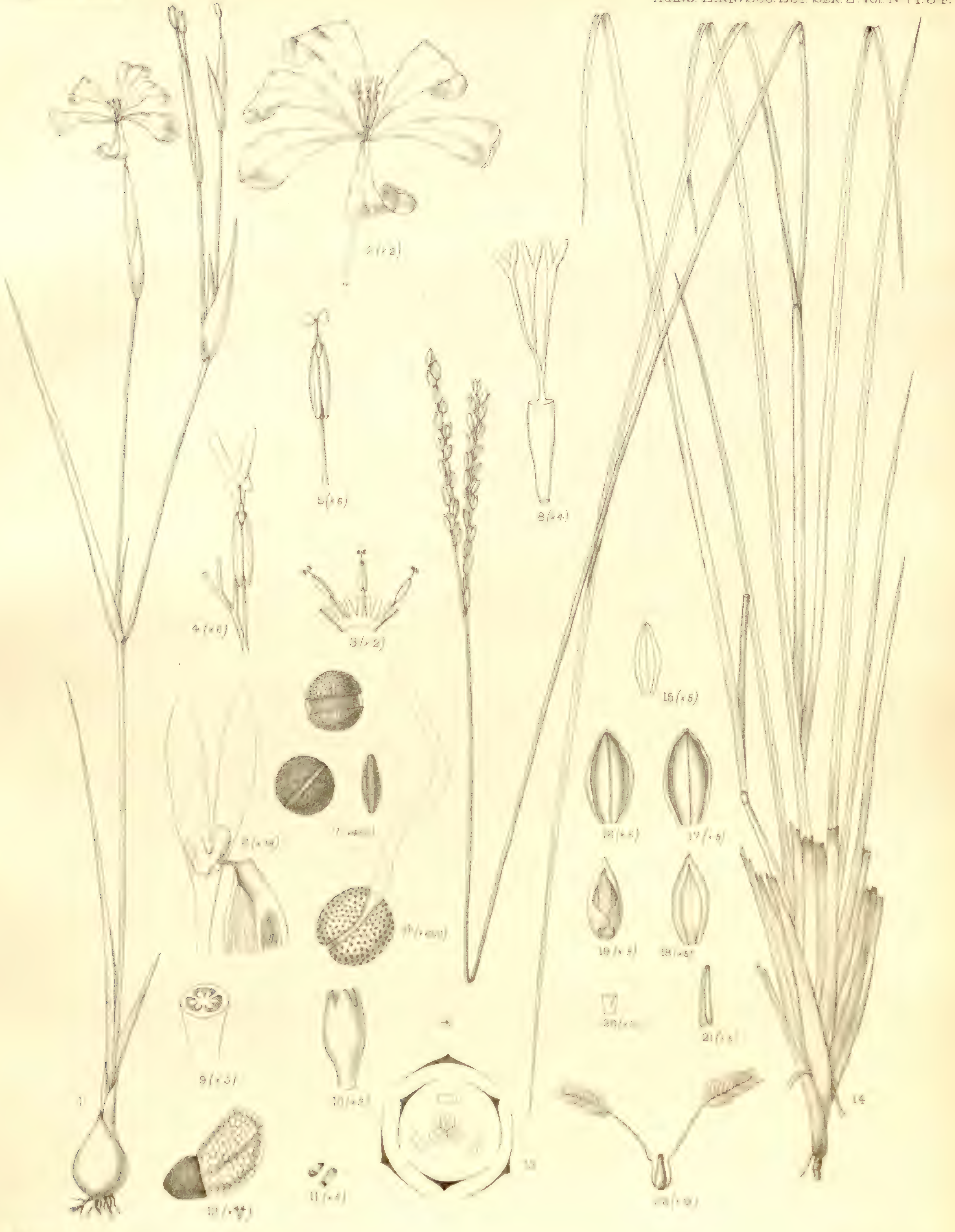
West, Newman imp.

Figs. 1-3, DICHÆA CORNUTA. Figs 4-10, NOTYLIA LYRATA.

R. Morgan del. et lith.
S. Moore anal.

1-5. COSTUS ACAULIS. 6. VANILLA? ENSIFOLIA.

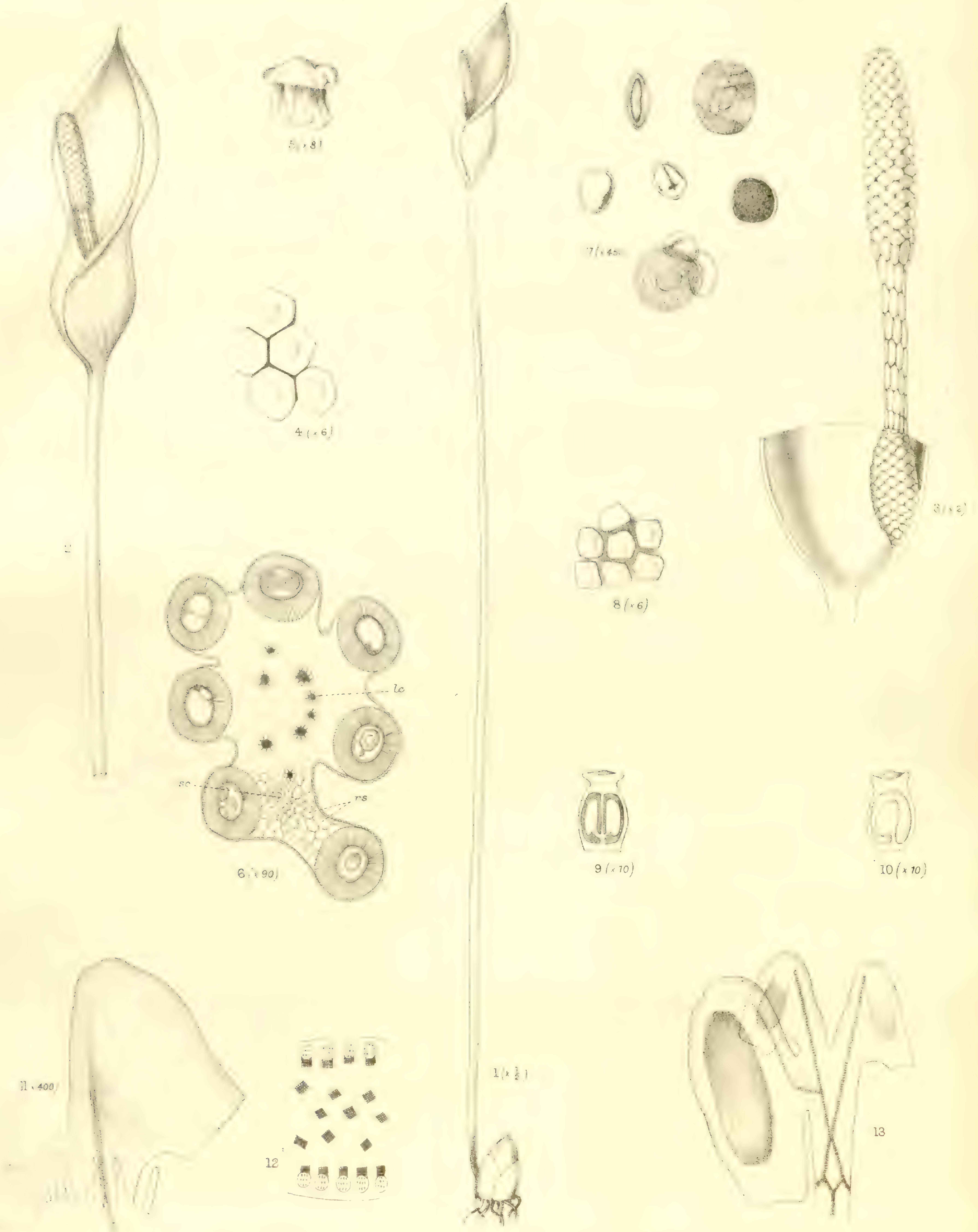
West Newman imp.



R. Morgan del. et lith.
S. Moore ann.

1-13. ZYGELLA GRAMINEA. 14-22. PANICUM FURCELLATUM.

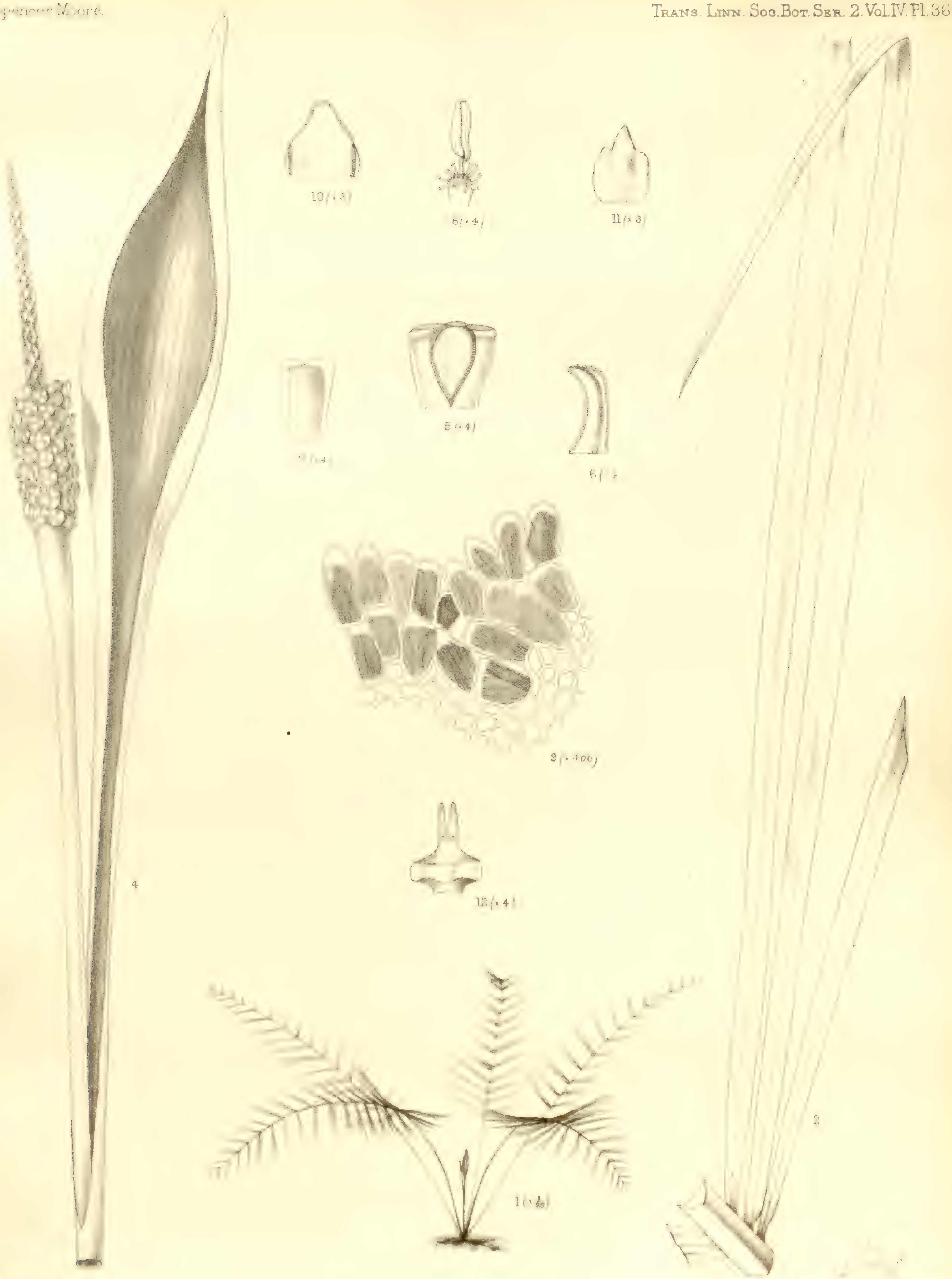
West, Newman imp.



R. Morgan del. et lith.
S. Moore anal.

West Newman imp.

1–12. APHYLLARUM TUBEROSUM. 13. CALADIUM HETEROTYPICUM.



R. Morgan del. et lith.
S. Moore anal.

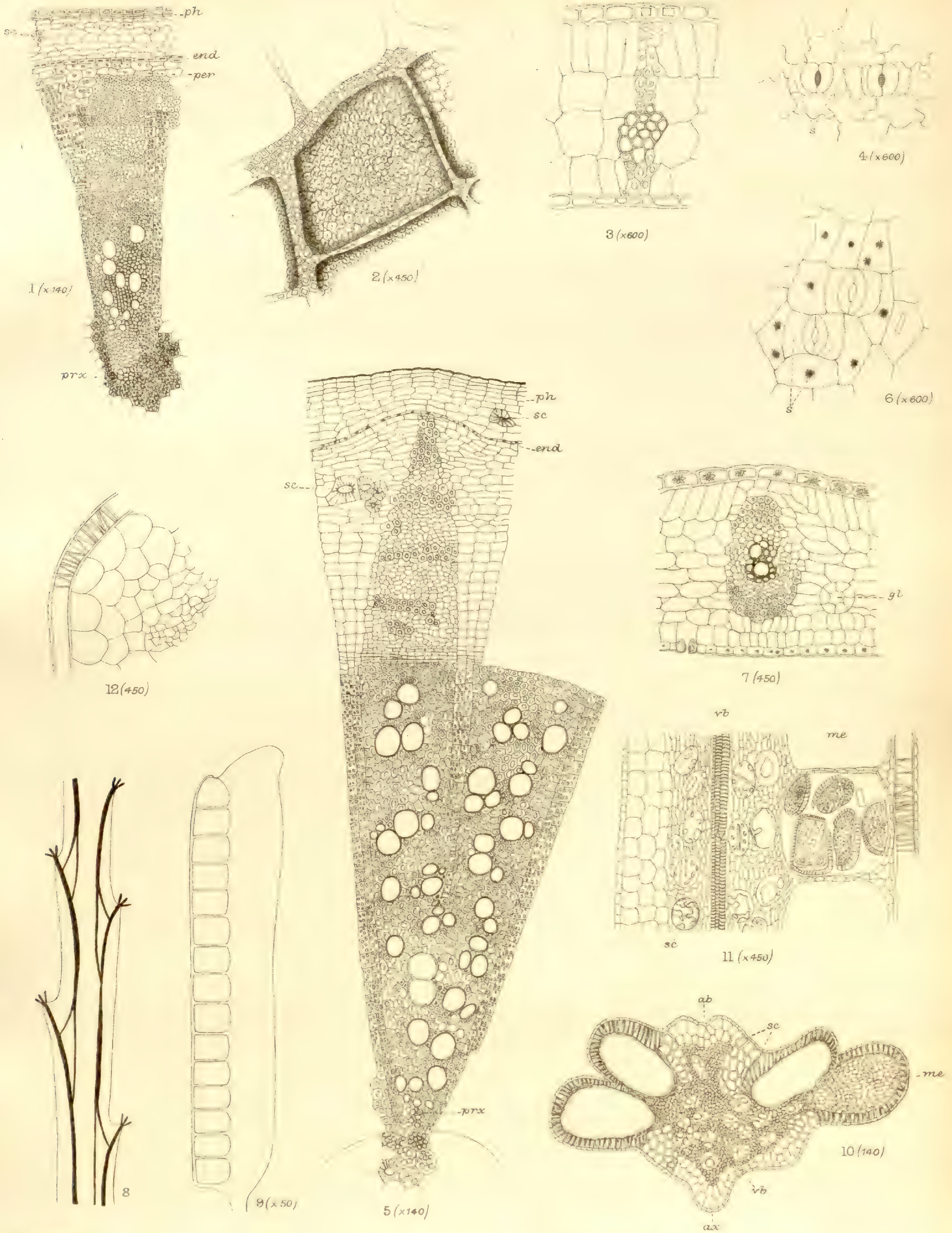
West, Newman imp.

DIPLOTHEMIUM JANGADENSE.

R Morgan del. et lith.
S. Moore anal.

West, Newman imp.

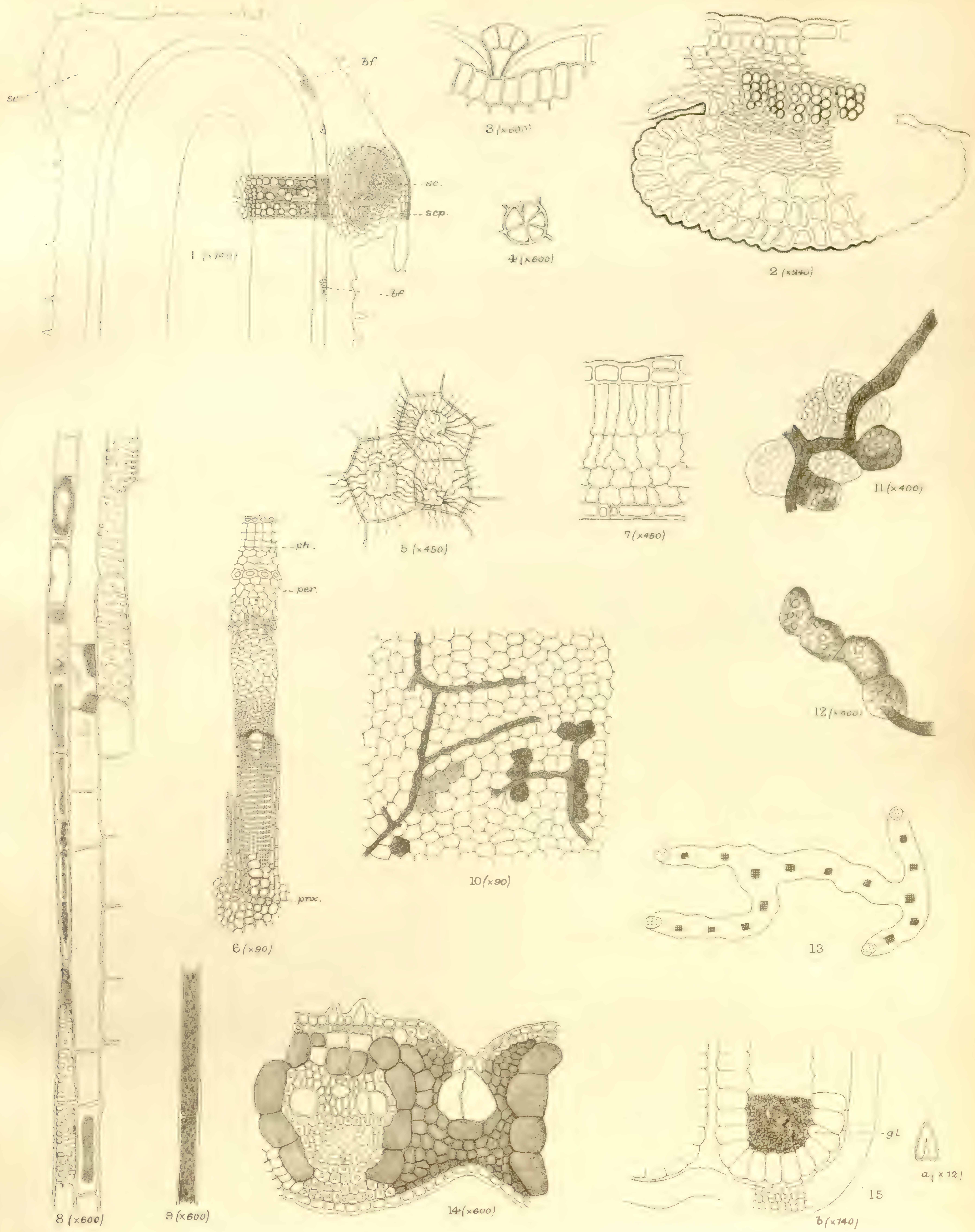
1-8. LUZIOLA PUSILLA. 9-23. POGOCHLOA BRASILIENSIS.



S. Moore del.
R. Morgan lith.

West, Newman imp.

1-4, EPHEDRANTHUS PARVIFLORUS.
5-12, STORMIA BRASILIENSIS.



S. Moore del.
R. Morgan lith.

West, Newman imp.

1-5, DESDEMONA. 6-12, BROSIMOPSIS.
13, ZYGELLA. 14-15, POGOCHLOA.

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	Part VIII.	1884.	0	10	0	0	7	6
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	Part III.	1895.	2	10	0	1	17	6
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